

June 13, 2014

Chairman Fred Upton
Energy & Commerce Committee
United States House of Representatives

Dear Chairman Upton,

Thank you for the opportunity once again to comment on communications law reform. In this third white paper, you solicited comment on competition policy and the role of the Federal Communications Commission.

The 1934 Communications Act was passed with common carrier rules for a national monopoly telephone provider. Today, in contrast, the communications market is characterized by rigorous competition from several networks—like LTE, fiber optic, cable, DSL, and satellite—offering many digital services—including Internet access, television, video-on-demand, and telephone service.

The overwhelming political consensus is that the older regulatory categories are no longer useful. As I said in response to your first white paper in January, “Like an old cottage receiving several massive additions spanning decades by different clumsy architects, communications law is a disorganized and dilapidated structure that should be razed and reconstituted.”

It’s unnecessary to start from scratch in crafting reforms. During the last congressional attempt at reform, in 2011, the Mercatus Center released a study discussing and summarizing a model for communications law reform known as the Digital Age Communications Act (DACA). That model legislation—consisting of five reports released in 2005 and 2006—came from the bipartisan DACA Working Group.

The DACA reports represent a flexible, market-oriented agenda from dozens of experts that, if implemented, would spur innovation, encourage competition, and benefit consumers. The regulatory framework report adopts a proposal largely based on the Federal Trade Commission Act, which provides a reformed FCC with nearly a century of common law for guidance. Significantly, the reports replace the FCC’s standardless “public interest” obligation with the general “unfair competition standard” from the FTC Act.

Those reports have held up remarkably well to the passage of time. The 2011 Mercatus paper describing the DACA reports is again attached for submission in the record. The scholars at Mercatus are happy to discuss this paper and the DACA reports further with Energy & Commerce Committee staff as they draft reform proposals.

Notwithstanding the DACA recommendations for a reconstituted communications competition agency, Congress should also consider alternatives such as abolishing the FCC entirely and relying on antitrust agencies or merging the FCC’s responsibilities with the Federal Trade Commission. New Zealand, the Netherlands, Denmark, and other countries have merged competition and telecommunications regulators. Agency mergers streamline competition analyses and prevent duplicative oversight.

Thank you for initiating discussion about updating the Communications Act. Reform can give America’s innovative technology and telecommunications sector a predictable and technology-neutral legal framework. When Congress replaces antiquated command-and-control rules with market forces, consumers will be the primary beneficiaries.

Sincerely,

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WORKING PAPER

THE CONTINUING CASE FOR SERIOUS COMMUNICATIONS LAW REFORM

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The ideas presented in this research are the author's and do not represent official positions
of the Mercatus Center at George Mason University.

The Continuing Case for Serious Communications Law Reform

Raymond L. Gifford

Communications law reform is like Brigadoon. It appears periodically, presents a gauzy vision of a better, more logical and sensible communications world, and then recedes into the mists, only to reappear again after a suitable interval. Lacking a book and lyrics by Lerner and Loewe, communications law reform might not make for quite as compelling a revival as Brigadoon, but it continues to reappear as a topic for the FCC chairman,¹ think tanks,² and Congress to discuss,³ even if it gets sent into hibernation by more pressing topics like mergers, net neutrality, or the latest indecent utterance or image broadcast on the airwaves. Nevertheless, a high-level consensus exists between progressive and free-market groups, the regulators and the regulated, that we need *some* reformation of the FCC and communications law, even if there is not agreement on the substantive details. If reform is not going to disappear again into the mists, then substantive proposals need to be brought forward, or, in the case of this paper, dusted off.

FCC reform has again pushed its way onto the stage, though perhaps not center stage. The House Commerce Committee, led by Communications and Technology Subcommittee Chairman Greg Walden, is proposing reforms at the FCC: more rigor and time limits in its processes, the use of cost-benefit analyses, and the curtailing of duplicative merger reviews with “voluntary” commitments. Despite these proposals, the current discussion surrounding reform accepts many of the legacy categories, methods, and assumptions of 1934 telecommunications law.

While FCC reform is necessary and salutary—even in the smaller ways currently being discussed—a more fundamental rethinking of the institutional and normative standards of communications law remains compelling. Technological change continues apace; appetite for wireless spectrum remains voracious and unable to keep up with consumer demand; universal service remains focused on subsidizing rural telephony; and the FCC continues to be tasked with incompatible statutory goals based on backward-looking technological categories. If the Telecommunications Act of 1996, itself an amendment to the Communications Act of 1934, was immediately rendered obsolete by the Internet,⁴ then 15 years on from that last revision, it surely remains ripe to reorient a communications law premised on monopoly and scarcity. Both the progressive left and

¹ Federal Communications Commission, “Statement from FCC Chairman Julius Genachowski on the Executive Order on Regulatory Reform and Independent Agencies,” news release, July 11, 2011, http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-308340A1.pdf.

² See Reforming the FCC, a joint project of Public Knowledge and Silicon Flatirons, <http://fcc-reform.org>.

³ Representative Greg Walden, chairman of the Subcommittee on Communications and Technology of the House Energy and Commerce Committee, is the latest to initiate legislation on FCC reform. See Walden, “FCC Needs Reform, Accountability,” September 18, 2011, <http://walden.house.gov/index.cfm?sectionid=94§iontree=8,94&itemid=747>.

⁴ See Robert C. Atkinson, “Telecom Regulation For The 21st Century: Avoiding Gridlock, Adapting to Change,” *Journal on Telecommunications and High Technology Law* 4, no. 2 (2006): 379, 403; John D. Podesta, Jr., “Unplanned Obsolescence: The Telecommunications Act of 1996 Meets the Internet,” *DePaul Law Review* 45 (1996): 1093, 1109.

free-market writers criticize the FCC for corporatism, for enabling rent-seeking, and for standardless “public interest” decision making. With this bipartisan agreement added to the mix, the imperative for bipartisan communications law reform becomes all the more compelling.

But imperatives for communications reform do not need to start from scratch. Indeed, current reform can profitably build from earlier efforts. Specifically, in 2005, the Digital Age Communications Act (DACA) working group published five separate reports on discrete communications law topics.⁵ The DACA project gathered more than 50 leading communications policy scholars, including lawyers, academic economists, think tank analysts, and technologists, to craft model regulations in five major policy areas. The working group also strove for ideological balance by including free market and libertarian analysts, although a majority of working group members served in Democratic-led administrations. While each individual did not have to agree with every recommendation, the reports’ goal was consensus on a better model than currently existed.

The working group published collaborative reports intended to guide regulators and legislators in their efforts to reform communications laws. Those reports resulted in a recommended model for communications law and became embodied in the Digital Age Communications Act of 2005.⁶ Although never implemented, DACA provides a good start for communications reform six years from its introduction.

To reintroduce DACA into the communications law reform discussion, this paper proceeds in three parts. First, it considers whether communications should be treated as a separate species of law rather than be handled under property, contract, and tort law. Second, the paper describes the DACA project, its composition, and its purpose and discusses and summarizes the DACA recommendations. Third, it looks at the issues DACA did not address and offers a DACA-like solution.⁷

I. Does Communications Need a Separate Law?

A threshold question for reformers is: Why treat communications law as a separate area of law?⁸

More than a decade ago, Peter Huber advocated communications law reforms in his book *Law and Disorder in Cyberspace*. The book’s subtitle gives its essential thesis:

⁵ Progress and Freedom Foundation, “Digital Age Communications Act,” <http://www.pff.org/daca/>.

⁶ *Digital Age Communications Act of 2005*, S. 2113, 109th Cong., 2005, <http://www.govtrack.us/congress/bill?bill=s109-2113>.

⁷ The original DACA recommendations emerged from working group consensus reports. Any suggestions here are the author’s own and have not been vetted through the DACA working group process.

⁸ A succinct presentation of this question comes from Judge Easterbrook in “Cyberspace and the Law of the Horse,” *University of Chicago Law Forum* 207 (1996). Judge Easterbrook cautions against legal innovations for the special case of the Internet, arguing instead that legal norms of property and contract will better allow the emergent order of the Internet to take shape.

*Abolish the FCC and Let Common Law Rule the Telecosm.*⁹ Huber argues that problems with communications law arose from its treatment as a discrete area of law. This treatment allows special interests to predominate, he states. He further argues that general common law, combined with antitrust law as an expression of the common law of unfair competition, would be much more effective at promoting the rule of law, competition, and consumer welfare in telecommunications. Huber also indicts the FCC based on its inglorious history of thwarting competition and innovation and protecting monopoly. After all, it did take an antitrust case to break up the AT&T telephone monopoly. Why, then, Huber asks, persist with a special-sector regulator like the FCC, when general laws and general courts can perform just as well, if not better, and without the public choice hazards?

A pure common law approach had great appeal to many DACA working group participants, and it retains strong normative and institutional advantages over an agency specially focused on communications law. For those concerned with “agency capture” (for which there is ample historical evidence), a general common-law approach solves the public choice problems endemic to a single-focus administrative agency. In the end, the technical expertise arguments and practical political impediments to abolishing the FCC won out as a consensus position among DACA members, and DACA rejected abolishing the FCC and letting general law take over the communications sector. However, as a baseline set of assumptions against which to evaluate reform proposals, common law norms of adjudication, case-by-case decision-making, and judicial rigor remained valued goals for the working group.

First, DACA noted that general antitrust law depends on case-by-case, fact-based adjudication, where general rules take time to emerge, particularly across multiple jurisdictions. Because communications networks are national, indeed, global, the need for rule uniformity calls for a national regulator. The absence of a federal common law further exacerbates the problem to the extent that state and federal laws would both have a separate track of “emergent” rules for communications.¹⁰ In addition, Balkanized legal rules would impede the scale of communications networks. If each state’s common law, plus federal antitrust law, had some rule to offer governing communications networks, the result would likely be laws that hampered communications innovation rather than enabling it.

Next, DACA endorsed a sector-specific regulator because the regulation of communications networks would take ongoing supervision and expertise, which courts of general jurisdiction are not suited to do. As the Supreme Court noted, access to networks and facilities “will ordinarily require continuing supervision of a highly detailed decree,” and “an antitrust court is unlikely to be an effective day-to-day enforcer of these detailed sharing obligations.”¹¹ It judged that a specialized regulator, with expertise in the

⁹ Peter Huber, *Law and Disorder in Cyberspace: Abolish the FCC and Let Common Law Rule the Telecosm* (New York: Oxford University Press, 1997). Nomenclature surely has changed since Huber wrote his book. “Telecosm” and “cyberspace,” neologisms then, sound quaint and outdated today.

¹⁰ *Erie v. Tompkins*, 304 U.S. 64 (1938).

¹¹ *Verizon Communications, Inc. v. Law Offices of Curtis J. Trinko*, 540 U.S. 398, 415 (2004).

technical details, capabilities, and potential of communications networks, would be superior to either an agency or court of general jurisdiction. It comes down to a prudential judgment whether this expertise and need for national uniformity outweigh the hazards of rent-seeking and agency capture.

Finally, the DACA working group's endorsement of a sector-specific regulator is premised on the judgment that economic regulation and social policies like universal service are inextricable, and that Congress will, for the foreseeable future, treat them together. The DACA model seeks to separate the economic regulatory issues from the social policy issues and seeks to create a single regulatory governance structure to promote both economic welfare and social policy goals, but with more straightforward and transparent regulatory mechanisms.

In the end, the DACA working group opted for a rewritten communications law. The proposed new law was intended to minimize some hazards of a sector-specific legal regime through increased use of *ex post*, adjudicatory-type mechanisms. The DACA working group's consensus judgment was that the benefits of a single, national regulatory regime outweighed its all-too-well-known costs.

II. DACA as a Model for Communications Law Reform

The DACA model for communications law reform consists of five discrete reports issued in 2005 and 2006. The reports address the following topics:

1. regulatory framework
2. universal service
3. spectrum reform
4. federal–state jurisdiction
5. institutional/agency reform

Since DACA's issuance, spectrum reform remains crucial, and universal service reform is timely given [1]FCC activity in just this past month. Other topics, notably the federal–state jurisdictional split, have diminished in importance. State regulatory issues have grown senescent and federal–state struggles over jurisdiction and regulatory priority have receded. Nevertheless, the reports cover the main topics that still need to be addressed in communications reform, and the DACA model remains a consensus of some of the best minds in communications law and policy. While any given choice of the DACA working group can be disputed, the group's judgments represent a model for Congress as it looks to broadly supported principles for communications law reform.

a. Framework

DACA's regulatory framework is its centerpiece recommendation and its most overarching purpose. The DACA working group adopted a proposal largely based on the Federal Trade Commission Act. This model embraces antitrust-focused thinking and centers on the idea that “competition law and economics provides the only sound basis for addressing communications markets in the future, as those markets become more

competitive.”¹² The DACA model does away with the persistent technological silos of “telecommunications,” “cable,” “wireless,” and so forth. Instead, it opts for the antitrust-derived standard of consumer welfare and embraces competitive markets as the first protection of that welfare.

The DACA working group did not embrace a pure antitrust model, however, because of concerns specific to the communications market:

The Working Group’s proposal nevertheless differs from a pure antitrust model in three regards. First, the proposal maintains the Federal Communications Commission as a sector-specific regulator. Second, the proposal imports the general “unfair competition standard” from the FTC Act as the principal substantive standard for FCC action. This standard, while based upon the antitrust laws, does allow the FTC some leeway to take action to prevent incipient violations of the antitrust laws. Third, the proposal allows the FCC to order the interconnection of public networks without a finding of an abuse of significant market power, although the proposal does require a finding that markets are not adequately assuring interconnection.¹³

The operative DACA statutory standards forbid “unfair competition” and “unfair or deceptive acts” affecting commerce. Under the FTC Act model, the regulator retains its investigative and enforcement powers, and DACA supports this model.¹⁴ In addition, DACA’s “unfair competition” model would import the understanding of that standard worked out through the FTC’s adjudications and litigation. The working group agreed with Judge Posner that “antitrust doctrine is supple enough, and its commitment to economic rationality strong enough, to take in stride the competitive issues presented by the new economy.”¹⁵

In adopting an FTC model, the DACA working group also generally preferred the FTC’s reactive, *ex post* adjudicatory model over the current FCC’s prophylactic *ex ante* rulemaking, with enforcement as an afterthought. Accordingly, under a DACA regulatory framework, the core regulatory functions would be administrative adjudications. The “new FCC” would retain limited rulemaking authority, but that authority would be tethered to “unfair competition” principles, not the more open-ended “public interest.” The breadth of “unfair competition” concerned some working group members, such that DACA explicates the standard as:

practices that present a threat of abuse of significant and non-transitory market power as determined by the Commission consistent with the application of jurisprudential principles grounded in market-oriented competition analysis such

¹² Randolph J. May and James B. Speta, *Digital Age Communications Act: Proposal of the Regulatory Framework Working Group, Release 1.0* (Washington, DC: Progress and Freedom Foundation, June 2005), 18, <http://www.pff.org/issues-pubs/other/050617regframework.pdf>.

¹³ *Ibid.*, 19–20.

¹⁴ See 15 U.S.C. § 45(b).

¹⁵ Richard A. Posner, “Antitrust in the New Economy,” *Antitrust Law Journal* 68 (2001): 925.

as those commonly employed by the Federal Trade Commission and the United States Department of Justice in enforcing the Federal Trade Commission Act and the antitrust laws of the United States.¹⁶

While section 3(a) of DACA constrains the FTC unfair competition standard, section 3(b) offers expanded regulatory supervision over interconnection. The working group concluded that denial of interconnection presented a uniquely important and powerful leverage point in communications networks, and hence specified supervisory regulatory authority over interconnection. The working group did not flat out require blanket interconnection, however, recognizing that consumer welfare harms from denial of interconnection had to be balanced by potential adverse affects on facility investment and innovation. The gist of the DACA recommendation is that interconnection still retains special regulatory scrutiny, but the commission would retain discretion over whether denial of interconnection would negatively affect consumer welfare.¹⁷

Along with the FTC act's antitrust thrust, the DACA model also prefers *post hoc* adjudication over the current FCC's rulemaking. Under DACA, the agency would have authority to entertain private complaints and would have enhanced remedial authority to award damages, where appropriate. Rulemaking authority would still be present under DACA, but would require "clear and convincing evidence" before the agency acts. DACA codifies a preference for *ex post* adjudication, but still allows the agency to act when marketplace competition breaks down.

The DACA model thus changes both the normative legal standard and the institutional focus of communications law. The legal standard—unfair competition—remains broad but is anchored in antitrust consumer welfare. Instead of rulemaking, institutional change prefers adjudication, which the working group identified as increasing rigor, reducing error, and reflecting the predominance of market competition in the communications arena.

To be sure, these antitrust-like standards have their detractors. On one side, opponents point to the negative social utility of much antitrust action and to antitrust's susceptibility to the same rent-seeking the FCC is so easily convicted of.¹⁸ On the other side, the progressive view finds antitrust too constrained to satisfy the desired regulatory scope of FCC action. The FCC's own Open Internet Order rejects any antitrust-like limits on the Commission's regulation of the Internet.¹⁹ DACA constitutes the mean between

¹⁶ DACA §3(a).

¹⁷ The working group endorsed the conclusions of Michael Katz and Carl Shapiro that interconnection and denial of it raises special concerns in "systems markets." The working group also heeded Katz and Shapiro's caution about information problems and status quo protection. See Michael L. Katz and Carl Shapiro, "Network Externalities, Competition and Compatibility," *American Economic Review* 75 (1985): 525.

¹⁸ See for example, Tom W. Bell, "The Common Law in Cyberspace," *Michigan Law Review* 97 (1999): 1746, 1753–57; see generally, Fred McChesney and William Shugart II, eds., *The Causes and Consequences of Antitrust: The Public-Choice Perspective* (Chicago: University of Chicago Press, 1995).

¹⁹ See Federal Communications Commission, *In the Matter of Preserving Open Internet Broadband Industry Practices*, GN Docket 09-191, WC Docket 07-52, 78, December 23, 2010, 45–46.

these two extremes. In itself, this position does not recommend DACA as the preferred normative policy, but it does give a basis for a broad political consensus about legal norms. Because DACA is meant to be a practical, politically viable reform model, it allows those more detailed normative legal fights to be carried into the reformed agency.²⁰

b. Universal Service

Universal service is both a central goal of U.S. telecommunications policy and a primary impediment to competition and rational pricing in communications service. Since AT&T President Theodore Vail proclaimed in 1907, “One Policy, One System, Universal Service,” the concept of universally available communications service at comparable prices has been at the core of communications law and policy. In practice, this policy has meant that some consumers subsidize others; some services subsidize others; and some places subsidize others. Because the cost of building and maintaining communications networks varies greatly with geography and population density, the universal service policy has required communications regulators to create a price and taxation system to roughly equalize services and prices. This system has introduced grave pricing distortions and has encouraged uneconomic entry into some markets as well as business models premised on price arbitrage rather than consumer benefit.

The DACA working group conceded the political reality and vitality of universal service. Like the Telecommunications Act of 1996, DACA seeks to make universal service policy more transparent, economical, and efficient. The universal service working group opened its deliberations with three questions. First, what should universal service policy accomplish? Second, how should universal service policy be funded? Finally, how should universal service be distributed? These are the perennial questions of universal service, but the answers must be adapted from the world of communications monopoly to that of competitive free markets, and from that of landline telecommunications to one of wired and wireless broadband.

DACA answered the first question—what is universal service for?—by proposing a universal service policy motivated by “securing affordable basic electronic communication services for low-income households and households located in high cost areas, with transparent, easy-to administer distribution and contribution mechanisms that are economically efficient and competitively neutral.”²¹ The supported service under DACA is called “basic electronic communications services” to reflect neutrality about what the service is and how it is delivered and to allow for advances in what is

²⁰ For instance, the DACA working group issued a statement on how net neutrality would be handled under the framework; see Randolph J. May and James B. Speta, *The Digital Age Communications Act’s Regulatory Framework and Network Neutrality* (Washington, DC: Progress and Freedom Foundation, 2006), <http://www.pff.org/issues-pubs/communications/other/031707dacastmt.pdf>. As this statement makes clear, DACA would contemplate hearing complaints in the vein of net neutrality concerns, but would evaluate them through a rigorous hearing process focusing on consumer welfare effects.

²¹ Randolph J. May and James B. Speta, *Digital Age Communications Act: Proposal of the Universal Service Working Group, Release 2.0* (Washington, DC: Progress and Freedom Foundation, December 2005), 2, <http://www.pff.org/issues-pubs/books/051207daca-usf-2.0.pdf>.

considered “basic service.” The standard for basic service is meant to be emergent and not tied to a specific technology, device, or platform.

The DACA proposal has three key features to encourage innovation and experimentation within and between the states on how to best maximize access and use of “basic electronic communications services.” It caps the overall size of the federal Universal Service Fund (USF). It distributes funds through performance-based block grants that encourage state governments to experiment with alternative subsidy mechanisms. Finally, it finances the USF primarily by a “numbers tax” on consumers and businesses.²²

The FCC would continue to oversee the USF and would still collect contributions for the fund. However, instead of directly transferring federal funds to communications providers, the federal government would allocate them to whatever entity—public utility commission or otherwise—the state legislatures appoint to administer the federal program. In managing the USF, the state administrator would have to comply with federal guidelines, but would have broad discretion to create different models and forms of universal service support. DACA’s block grant program would set forth broad federal goals, and within those goals states would be free to use the universal service grants as they saw fit. States could experiment with plans as disparate as traditional support of specific carriers, service vouchers to eligible consumers, or reverse auctions between providers. States would still be accountable to federal standards and surely would be susceptible to local public choice pressures. But the working group believed that the local public choice hazards would be outweighed by the value of experimentation with metrics that reward least-cost support and by incentives to achieve universal service performance metrics.

On the support side, the working group believed that a numbers-based assessment mechanism would be the least distortive and most broad based of the universal service support mechanisms. In assessing the different options for a contribution mechanism, the working group discussed a connections-based tax (based on non-linear taxes on a per-connection basis); a usage tax, and finally a numbers-based tax. The working group opted for a pure numbers-based tax levied on all telephone numbers. The consensus was that the numbers-based tax would be technologically neutral and be levied on the least elastic service: access. This system would best meet the economic criteria of optimal tax policy.

The universal service working group was skeptical of continuing a communications-focused subsidy policy. The preferred economic path for universal service policy would be general taxation and funding from general governmental revenues. This path would be the least distortive and most politically accountable. Nevertheless, communications law discussions inevitably center on untangling the long tentacles of universal service policy in current communications pricing. It is difficult to

²² A numbers tax would assess a tax on each assigned telephone number to raise revenue for the Universal Service Fund.

imagine how universal service policy would not be a continuing central concern of whatever communications reform was proposed.²³

c. Spectrum

Efficient allocation and use of the electromagnetic spectrum has been an acute challenge for communications regulation since the advent of the Federal Radio Commission in 1927. The central problem is a classic question of property law: “interference.” One party’s transmissions interfere with those of another party in the same (or a neighboring) geographic area and/or spectrum band. Historically, spectrum has been treated as a national resource managed centrally by the FCC. In practice, this has meant that the FCC allocated spectrum (a) to specific uses—e.g., broadcast radio or television; (b) by defining service parameters—e.g., transmitter power; (c) by assigning licenses to specific parties for transmitting over specific frequency bands at specific locations; and (d) by enforcing its allocations, service rules, and assignments.

Transfers under this command-and-control model can only happen with FCC permission. In practice, this means inordinate delays, costs, and burdens for spectrum to be efficiently utilized. To be sure, the FCC has taken steps toward a more market-based approach to spectrum allocation. But reform has been slow, and progress only partial. The economics literature is nearly unanimous in stating that property rights in spectrum are superior to the current licensing scheme,²⁴ and that spectrum allocation should take place through auctions that put its use in the hands of the entity that values it the most. The DACA spectrum working group, while considering alternatives, concluded that “there is no serious contender for a system that can be expected to perform as well or better” than a property-based system of spectrum allocation.²⁵

The DACA working group described the property right in spectrum as follows:

The property right would be defined in terms of the right to transmit over a specified spectrum band and geographic area (and during a specified time period) subject to: (1) an out-of-band emission limit; (2) an in-band power limit (because receivers in adjacent bands may be affected by in-band power even if out-of-band emissions are zero, or . . . there may be other in-band licensees); and (3) a field-strength limit for out-of-area emissions. The out-of-band and out-of-area emissions limits would be defined at the band and geographic boundaries, respectively.²⁶

²³ Federal Communications Commission, “Statement of Chairman Julius Genachowski re: Connect America Fund, WC Docket No. 10-90,” news release, October 27, 2011, http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db1027/DOC-310695A2.pdf.

²⁴ The pioneering work here is from Ronald Coase, who in 1959 argued for property rights in spectrum. Coase, “The Federal Communications Commission,” *Journal of Law & Economics* 2, no. 1 (1959). This paper is also the first place his famous Coase theorem appeared.

²⁵ Thomas M. Lenard and Lawrence J. White, *Digital Age Communications Act: Report from the Working Group on New Spectrum Policy, Release 1.0* (Washington, DC: Progress and Freedom Foundation, 2006), 3, <http://www.pff.org/issues-pubs/books/060309dacaspectrum1.0.pdf>.

²⁶ *Ibid.*, 7–8.

The working group identified a property rights system as best adapting to new or unforeseen uses of spectrum. Further, property rights enable bargains between spectrum owners who value a given band or use. The working group rejected a wholesale commons model for spectrum, concluding that the conditions of a surfeit of spectrum did not apply, and noting that the regulatory supervision a commons model would require would exceed even that of the command-and-control inheritance. The spectrum working group retained a healthy respect for, and place for, unlicensed uses.

Of course, the transition between the current system and a property system is a large part of the problem, and the reason that the FCC—which, to its credit, has generally championed auctions and market-based spectrum mechanisms—has not decreed an immediately open market for spectrum. The FCC gave away much of the spectrum currently in use. To allow these users to simply resell what was conceived as a “public resource” would result in tremendous windfalls. Other users purchased portions of the spectrum at auction and operate it under an FCC license. Because the various allocations cover different uses and different permutations of a more complete property right, the working group offered a transition framework. To accomplish the transition, the DACA proposal treats spectrum differently based on how and where the current license was obtained. There are three broad classes of spectrum:

1. Spectrum that is exhaustively, exclusively (or with well-specified priority rights), and relatively flexibly licensed, with licenses purchased at auction (e.g., the personal communication services [PCS] licenses). This class mostly already operates under a market-driven regime. Under the DACA proposal, it would acquire formal property rights; other than that, it would be largely unaffected.
2. Spectrum encumbered by current use constraints, either on the nature of the service offered or on the time and scale of the service offering. This spectrum may have been licensed by auction or by other mechanisms, and may be exclusively or nonexclusively licensed (e.g., time-shared under a “listen-before-talk” requirement). The key feature is that the current licensee has less complete property rights than will attach to spectrum in the future under a market-based, fully allocated rights regime. Generally, spectrum in these bands is not exhaustively licensed; instead, these licenses give the users the right to operate certain equipment in defined frequencies and geographic areas at defined power levels.
3. Unassigned spectrum, including white spaces—the unused and unencumbered portions of spectrum licensed under category 2.

The transition options discussed below apply to the second and third classes.²⁷ Each option establishes property rights immediately, but the configurations of those rights differ based on distributional and transaction-cost concerns.

²⁷ Ibid., 11.

The DACA working group endorsed a “spectrum registry” akin to a clerk and recorder’s office for real property. The registry would facilitate spectrum transactions and help buyers and sellers to identify one another. The registry’s overall purpose would be to lower transaction and negotiation costs. The public could view who owns what spectrum and under what parameters and power limits. The public could then negotiate more optimal uses or powers or address interference concerns.

Once regulators established spectrum property rights, regulators’ operative role would be to enforce those rights or to provide a forum for that enforcement. Accordingly, DACA turns to the law of trespass for its adjudicatory standard over spectrum rights. The law of trespass would govern respective uses of spectrum—interference questions, for instance, would be cast as trespass claims. Institutionally, these rights could then be adjudicated, whether by courts of general jurisdiction or through a reconstituted FCC with administrative adjudicatory processes. Because of the specialized and ethereal nature of spectrum, specialized FCC administrative courts might make the most sense, according to DACA.

The end goal of spectrum reform would be more spectrum, better utilized, in the hands of those who value it most. The working group strongly endorsed a property system to achieve this goal, using any practical accommodations necessary to effectuate that transition.

d. State–Federal Relations

Traditionally, the state–federal regulatory authority has been conceived as “separate and dual.” States had jurisdiction over local monopoly telephony, and the federal government regulated interstate networks, wireless service, and broadcast issues. The DACA recommendation continues the trend toward greater federalization, and even raises traditional issues of local control like franchising to the statewide level. The DACA working group discussions of state–federal relations were fraught with competing claims and strong views about traditional regulatory prerogatives. Today, that controversy has largely subsided.

The DACA working group’s recommendations reflected that the overall structure and direction of communications regulation is federal. The need for a unitary regulatory framework, the belief that that communications policy should be a subset of general competition policy, and the concern over avoiding patchwork regulation and spillover effects from state regulation all pointed toward communications policy being a federal matter with limited state jurisdiction.

DACA proposed delegating to states and localities the authority to promote public safety and homeland security and to manage public rights-of-way, subject to federal law and a prohibition on effects that spill over state boundaries. DACA favored granting states the discretion to impose streamlined certification requirements. State fees for access to rights-of-way would be limited to the costs of such access.

In short, the working group endorsed a carefully circumscribed role for states and localities going forward in communications law. It recommended eliminating rate regulation, except under narrow circumstances. States would continue to be empowered to deter and remediate fraudulent activities such as slamming and cramming, but they could not engage in economic regulation under the guise of consumer protection.²⁸ While the working group at the time allowed states to retain a basic local service rate, even that rate regulation, in the time since DACA issued its reports, has begun to wane on a state-by-state basis. Hence, a “current” version of DACA might eliminate basic local service rate regulation in all instances save clear monopoly provision of communications services. Finally, states would retain supervision of alternative dispute-resolution procedures and other processes for solving consumer fraud problems.

A self-conscious commitment to an integrated regulatory framework would best promote sound communications policymaking, the working group found. Under such a model, states and localities would be permitted to regulate only within federally authorized spheres. This authority involves both an explicit delegation of authority—as exists, for example, under the 1996 Act’s interconnection agreement regime—and a tolerance (through a “savings clause”) for states to act in ways that do not affect other states and that are “not inconsistent” with federal regulatory policy.

e. Institutional Reform

DACA’s institutional reform recommendations cannot be separated from the regulatory framework discussion. The framework envisions a competition policy agency focused on adjudication, not rulemaking. To complement this legal standard, the Institutional Reform Group recommended that a split agency model be adopted as the institutional mechanism for executing the regulatory functions proposed under DACA. In practice, a split agency model would mean that a multimember agency similar to the present FCC would be responsible largely for conducting the adjudications envisioned under the new statute, and a single executive branch official would be vested with the authority to conduct the more limited rulemaking proceedings envisioned by the new act as a means of establishing policy. The working group thought that the split-agency model would better serve the twin goals of political accountability for administrative policymaking through rulemaking while achieving efficient, effective, and sound decision-making through adjudicatory rigor.

The agency split would proceed as follows. Rulemaking authority for the agency would be vested in a single official located in the executive branch. The adjudication function (the principal form of agency action under DACA) would remain the FCC’s role in its current multi-member form. The reformed commission would focus on a function within the traditional competence of multi-member panels—applying established principles to specific facts and circumstances during the adjudication of particular cases.

²⁸ “Slamming” and “cramming” involve the fraudulent actions of communications carriers to switch a subscriber’s communications carrier (slamming) and add unauthorized charges to communications bills (cramming). Both are instances of consumer fraud.

Spectrum functions—registry supervision and the conduct of options—would be in the hands of the single executive branch administrator. In essence, DACA’s institutional setup could be viewed as transferring the rulemaking/policy decisions over the current National Telecommunications and Information Administration, with the FCC remaining an adjudicatory body. The FCC, sitting in its adjudicatory capacity, would also make certain policy, but the primary rulemaking role would now be split off to a politically accountable executive branch official. Because the DACA FTC model reduces regulation through rulemaking, this institutional structure would still keep a large regulatory nexus at the FCC, but the executive branch would make the broader policy calls in rulemaking.

The institutional structure of communications law should be considered as important as the substantive legal standards. A broad antitrust standard in the hands of a lawless agency disinclined to rigor would accomplish little. That same standard in a more self-consciously adjudicatory and law-abiding agency would be better than current practices.

III. What Is Missing?

DACA did not presume to encompass every topic in communications law. Media law and ownership constitute the most glaring omissions. DACA also sidestepped content-regulation issues and public safety communications and networks. In addition, circumstances may have overtaken some of DACA’s recommendations, illustrating how even a self-consciously forward-looking regulatory plan can mistake what the future will hold. For instance, federal–state issues appeared central to the working group in 2005–2006. Now, those issues seem largely worked out, with the states stepping aside for a national regulatory model.

Because it is styled as a law of general applicability within the communications sphere, DACA should be able to encompass issues like media ownership. An “unfair competition” standard with an antitrust pedigree would apply to media ownership and concentration issues. This standard would not satisfy those who are concerned about media ownership and concentration issues. Nevertheless, it would require a rigor and level of proof that are currently lacking from media ownership debates. Congress could add social policy objectives relating to media ownership, subject to constitutional constraints. Nevertheless, a DACA model for media ownership would begin with a strong presumption that the standards of general applicability from the FTC Act and the institutional method of adjudication would be the preferred lenses through which to view media issues.

Content issues do not fit neatly into the DACA framework. Competition policy law does little to regulate speech, particularly in a fecund media environment. While First Amendment law might be on the way to making specialized administrative regulation of content obsolete, DACA in its outlook and aims would not encompass a content regulation regime. The DACA response, if there were one, to proposals for content

regulation would likely leave such regulation to other agencies or to Congress rather than to the specialized competition policy agency that DACA contemplates.

Conclusion

Communications law reform remains a perennial topic because the categories, aims, and institutions of the 1934 and 1996 telecommunications laws are ill-suited to current technological and market reality. The “digital broadband migration,” a term coined in 2000 by then-FCC Chairman Michael Powell, has continued apace, and law must be updated to reflect the technological reality. DACA thoroughly considered many models and standards for communications regulation, and a bipartisan group of scholars and analysts agreed on consensus outcomes. If Congress takes up communications reform on a wholesale basis, it can start with DACA as a roadmap to thinking about reform.

Dear Sir or Madam,

America's doctors and other medical professionals' work has changed by the rapid innovation of Internet-related technologies. This innovation has led to the advancement of telemedicine whereby medical information can be transferred from one site to another site through digital communications to help improve and facilitate diagnosis and treatment of individual patients. Telemedicine innovation relies on the ability for competition among all entrepreneurs and businesses in the Internet ecosystem. This competition has helped bring Internet services to a higher percentage of citizens in the U.S. than anywhere else in the world. Especially in rural states of which North Dakota is a great example. The FCC has found that 98.5 percent of North Dakotans have access to wired or wireless broadband service.

As Congress debates future Internet policy, I hope Members will take the views of America's medical professionals into consideration. For more on this issue, please below for an article I wrote this year in North Dakota's Dickinson Press, "Improving rural health care through broadband, bringing doctors to their patients."

Regards,

Douglas Smith, M.D.
WorkPartners of North Dakota
Triage/Medical Management
653 19th Street West
Dickinson ND, 58601

Smith: Improving rural health care through broadband, bringing doctors to their patients

By Dr. Douglas Smith

<http://www.thedickinsonpress.com/content/smith-improving-rural-health-care-through-broadband-bringing-doctors-their-patients>

April 7, 2014

Lost in the political squabbling surrounding the Affordable Care Act is the extraordinary work of our nation's doctors. For generations, they have been the backbone of our health care system — from those doctors of a bygone era who made house calls to the cutting-edge medical specialists of today.

Many factors have contributed to the evolution of the physician's role in our society. But perhaps none have had the potential as the explosion in medical technologies that have been spurred by the Internet as it reshapes the delivery of health care in the U.S.

Now, as we have just passed the 24th anniversary of National Doctor's Day, we are at a critical moment. It is by no means a given that we will continue to make the kind of technological strides that have brought us to this point. To spur further innovation in the medical field, state and federal officials should focus on smart policies that extend the reach and adoption of broadband services.

The technology behind medicine has evolved drastically, allowing today's medical professionals to treat and prevent disease and conditions that plagued earlier generations. Broadband Internet greatly enhances this knowledge transfer, enabling doctors to share information across the world with a goal of improving health care outcomes through collective input.

In North Dakota, the rapid communication afforded by broadband is crucial. The Peace Garden State has the second-lowest population density in the country, leading to long trips to the nearest doctors and hospitals. But broadband technology can bring doctors and medical facilities closer.

While our population is dispersed, 98.5 percent of North Dakotans have access to wired or wireless broadband service, and more than 86 percent of our state's population has access to speeds of 10 megabits per second. This access to broadband can be leveraged through different telehealth technologies to bring doctors and patients closer together.

This next evolution in health care can be stimulated further if lawmakers modernize outdated laws to help promote greater broadband adoption and innovation. One example is the objective by Congress to update the Telecommunications Act of 1996.

Modernizing this law, which oversees America's communications networks should take considerable deliberation from North Dakota's Congressional delegation and input should be sought from participants in many areas of today's Internet ecosystem, including our state's entrepreneurs. Any new updates to the Telecommunications Act must foremost help facilitate, and avoid interference with, the growing medical-related innovation and digital commerce taking place in our state.

When it was written, the current Telecommunications Act did not account for the dynamic competition in today's broadband marketplace. In 1996 telephone lines were essentially the only way to connect to the Internet.

Consequently, the law placed services like "cable" and "telephone" into different regulatory silos. However, today wireless, telephone, cable, satellite and fiber-optic networks all compete and converge to bring consumers Internet access. Updating the current Telecommunications Act should account for this dynamic and allow for future innovation in broadband services.

To date the wisdom of a cautious regulatory approach to the Internet has allowed for broadband technology to advance at a rapid pace. This approach has enabled advances in telehealth. For instance, teleneurosurgery consultations, where a neurosurgeon can view a patient's CT scan and then evaluate the patient over video conference, give patients access to more specialists. Other innovative programs are as simple as offering support for at-risk

pregnant patients through every day technologies like text messaging. With robust wired and wireless networks companies have created over 97,000 mobile health apps that help people monitor their health and wellbeing. These improvements in Internet technology contribute to advances in life-saving innovations.

Telehealth's continued success will depend upon robust network investment to ensure that Internet service providers continue to expand and improve their networks. Fortunately, between 2009 and 2013, private broadband providers have invested nearly \$250 billion in Internet infrastructure.

Public officials can help facilitate this tremendous progress. The decisions Congress makes for how we modernize the Telecommunications Act can potentially create greater opportunities for broadband providers and health entrepreneurs alike to invest, invent and compete.

Improving the availability of health services and technology will ensure North Dakotans have the same access to medical care as people living in large cities or densely populated states. In today's connected age, our state's rural communities should have access to the level of health care and cutting edge medical technologies we all deserve. As we commemorate National Doctor's Day, modernizing today's communications laws will be a key step towards this important goal.

Dr. Douglas Smith is a founder of WorkPartners, a triage and medical management firm practicing occupational medicine with telephonic injury triage and co-founder of MinuteClinic and the retail clinic business model.

U.S. House Energy & Commerce Committee

2125 Rayburn House Office Building

Washington, DC

Re: Competition Policy and the Role of the Federal Communications Commission

Smithville Communications, Inc. was founded in 1922. The purpose behind its creation was to connect limestone quarries in the towns of Smithville, Ellettsville, and Clear Creek in rural Monroe county.

By 1933, Guy Draper secured majority interest in the company that by then was connecting rural Indiana Communities by delivering telephone service to residences and businesses in these towns. Today, Mr. Draper's great-granddaughter, Darby McCarty and her son, Mr. Draper's great-great-grandson represent the fourth and fifth generation of the family that has always owned Smithville Communications, Inc.

With growth through acquisitions of small rural telephone exchanges in the 1950's and 1960's, Smithville introduced dial-tone technology that enabled private line telephony. This new technology enabled rural communities to place calls without worrying whether or not their neighbor down the road was on the line. With private lines, Smithville was also able to streamline the cost of calling by doing away with local operators. We have a 75-year heritage of bringing cutting edge technology to people who would otherwise be without it.

By the 1980's, Smithville was investing in digital switching technology that enabled clearer phone connections and cost savings with lower switch maintenance costs. Complex mechanical switches were eventually replaced with computerized digital switches. The company has a heritage of upgrading its technology so rural communities would never experience the digital divide.

In the 1990's, we invested in fiber optics between our twelve exchanges. This investment enabled more capacity for calls and a growing demand for data services as well as special access circuits for long distance calls and cellular towers located in Smithville's territory. At the millennium, Smithville Communications, Inc. was providing dial-up internet services to its customer base and began investing in regional fiber networks to transport more data. Over this regional fiber Smithville provided DSL to customers beginning in 2001. Smithville's commitment to its rural customers-residential and business and a leading university-has been relentless.

In 2007, Smithville Communications, Inc. entered into a loan agreement with the USDA's Rural Utilities Service for \$90 Million to build out and upgrade its existing copper network to fiber optics. Currently, over \$100 Million has been invested to bring Fiber-To-The-Premises to nearly 15,000 homes and businesses.

Smithville employs about 175 workers today in both Indiana and Arkansas. You might be interested to know our market today is undergoing monumental change. We still have many thousands of people with landlines even though mobile services and demand are at an all-time high. We still have customers today that dial in to reach the Internet. We still have pockets in our geography where cell phone service fails. And, we have more people than ever interested in a satellite TV service.

In 2011, the FCC issued an order to reform the Universal Service Fund (USF) using a version of the Quantile Regression Analysis (QRA) to determine high cost support in rural areas. As a result of this formula, Smithville took an enormous financial hit and lost millions of dollars in government support. The formula punished Smithville for making an early investment in fiber optics to its rural communities.

During this time of QRA implementation, Smithville did not have the ability to remonstrate protest and prove its financial loss to the FCC. Congress had granted the FCC this authority under the Telecommunications Act of 1996. Our national trade associations at that time, OPASTCO and NTCA, were warned by the staff of then-Chairman Julius Genachowski to not lobby Congress on USF reform and to publicly praise the FCC for their efforts at reform of the USF.

It is our belief that the FCC is a federal agency that is outdated. They don't have the ability or experience to keep up with the technologies, the telecommunications markets, infrastructure necessary, or the average rural customer's needs. Companies, like Smithville, have kept ahead of the technology curve by consistently investing in their own networks to provide consistent quality service to rural American families and businesses.

1. Competition in the modern communications marketplace is currently being defined by the market. In urban areas, competition exists. In some rural areas, competition also exists. However, in many rural areas, competition DOES NOT exist and unless there is a telecommunications company of last resort some rural families would not have access to the Internet or cell phone service coverage. Consumer demand for mobile devices is at an all-time high but seems to have peaked here in the U.S. On the wireline side, consumers have a choice in a majority of population centers. That choice boils down to either a cable connection or a telco connection. TV is the main driver at this point but it is followed closely by broadband. With so many different Over-The-Top video providers offering service, a growing number of consumers are choosing to keep their broadband connection and cancel TV service. These activities are taking place in a fluid market with no regulation from government. The Telecommunications Act of 1996 allowed for this "hands off" approach to advanced telecommunications services, so one could argue that the federal law encouraged the rapid adoption of these technologies the past eighteen years.
2. The modern communications ecosystem is constantly changing. Products and services, usually a software app, appear in the ecosystem on a daily basis. Policy principles should be structured on fostering innovation in recognizing these constant changes. If and when a single

company reaches the point of market saturation in any service, that company should be held to existing law and policy as far as anti-trust matters are concerned. We believe that the Department of Justice and not the FCC should make that determination.

3. Intermodal competition is difficult to factor into any analysis of competition in the broad sense of the market. Mostly anecdotal evidence would suggest that consumers use devices in different ways. Some may use only handheld mobile devices for all of their communication needs while some may use a combination of wireline for the home and wireless for mobile applications. In a few years, bandwidth demand could outpace the capabilities of wireless in delivery of gigabit service and consumers will then gravitate more toward wireline for their principal form of communication to consume terabits of data. In that case, wireless becomes solely a mobile play at a universal level.
4. The FCC should be strictly an enforcement agency. As our company witnessed after the implementation of USF reform in 2011, constituents have no way to remonstrate against such rulings. Remonstrance is a constitutional right and should be protected with vigilance by Congress. It is the Congress that legislates and not unelected commissioners of an executive branch agency. In TA '96, Congress abdicated that authority to the FCC. Therefore, in the Communications Act update, that constitutional authority should be restored. In regards to competition policy, the FCC should act as enforcer of communications policy in all modes. Perhaps the FCC should be a commission within the DOJ?
5. With regard to competition policy in the communications marketplace, why is this not under the DOJ? Policy in communications should mirror that of policies that protect consumers in other market areas. Market dominance in the number of broadband subscribers, TV subscribers and the percentage of video content owned by these Comcast and Time Warner Cable entities should be scrutinized closely and the consumer's best interests taken in consideration. Comcast has an arrangement with Verizon to resell their wireless products in a bundle. The scope and leverage of that customer base will increase with a merger.
6. Consumer demand for more bandwidth for mobile devices is driving spectrum policy. As Chairman Wheeler noted in his testimony, "They don't make any more spectrum." Again, consumers seem to use spectrum for mobility and not a substitute. Note the growing number of "TV everywhere" services offered by various video providers. That technology enables consumers to pause a program on their TV set at home and resume play on their mobile device if travelling. It would be a grave mistake for policy makers to assume that intermodal competition is a concern. The market is taking care of that issue through consumer behavior.
7. As mentioned in Answer #5, merger and acquisition activity such as the proposed Comcast-Time Warner Cable merger comes with a bundled offering from Verizon Wireless. Currently, AT&T is working to acquire DirecTV. This deal could expand each other's service offerings with AT&T wireless services bundled with DirecTV and DirecTV bundled with AT&T landline and wireless offerings. Will the AT&T-DirecTV deal give AT&T more leverage? That remains to be seen but these two deals could shrink the number of providers if they are exclusive in their offerings and preferential treatment is given to promote each other's services. A potential Sprint deal with T-Mobile would trim the number of major wireless providers down

to three. We doubt that Sprint's parent company, Softbank, will stop with T-Mobile under a merger and acquisition strategy.

8. The challenge in regulating edge providers is that they are a part of a global ecosystem. Google, Amazon, Apple, et al. offer services in countries around the world. Just this past month, Alibaba, a Chinese company, announced that it will issue an IPO on either the NYSE or NASDAQ in the near future. On the other hand, the EU has regulated Google to surrender its possession of consumer data. Policy should focus on edge providers contributing toward sustaining our nation's networks. This would be a retooled inter-carrier access regime based on bits of data instead of minutes of voice traffic.
9. Our argument would be that business is business and basic principles should apply when it comes to regulation. Policy should be careful not stifle innovation, but to foster and allow for the continuation of growth in the tech sector. The protection of intellectual property, the prohibition of patent trolls, and a revised inter-carrier access regime are examples. In addition, Congress should recognize that in some geographic areas competition does not exist.
10. Yes, by all means. Legislation surrounding technology should be revisited every session of Congress

Please let me know if you have any questions or want to discuss these matters.

Respectfully submitted,

Cullen McCarty

Executive Vice President - Smithville Communications

Vice President – Rice Belt Communications, Weiner, Arkansas

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Sprint – Government Affairs

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June 13, 2014

The Honorable Fred Upton
Chairman, Committee on Energy and
Commerce
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Greg Walden
Chairman, Subcommittee on
Communications and Technology
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, DC 20515

Dear Chairmen Upton and Walden:

Thank you for the opportunity to present Sprint's response to the questions posed in the Committee's "Competition Policy and the Role of the Federal Communications Commission" white paper. We look forward to continuing to participate in the Committee's ongoing efforts to examine the Communications Act of 1934, as amended. Please don't hesitate to contact me if you have any questions regarding the attached submission.

Sincerely,

A large black rectangular redaction box covering the signature of Bill Barloon.

Bill Barloon
Vice President, State and Federal Legislative Affairs

cc: Honorable Henry A. Waxman, Ranking Member, Committee on Energy and
Commerce; Honorable Anna G. Eshoo, Ranking Member, Subcommittee on
Communications and Technology

Attachment



Competition Policy: The Foundation for Any Update to the Communications Act

June 13, 2014

Promoting and ensuring competition should be the single most important principle in any potential update to the Communications Act. A vigorously competitive communications market will provide consumers better service and lower rates, and will encourage infrastructure investment and broadband deployment. Accordingly, Sprint endorses the Committee's focus on competition in the instant white paper, and provides below its input to the questions posed by the Committee.

1. How should Congress define competition in the modern communications marketplace? How can we ensure that this definition is flexible enough to accommodate this rapidly changing industry?

The definition of competition should be based on the existence of market power, not tied to the use of a particular technology, protocol, business model, or class of service provider. If a company or consortium is able to charge prices that are above cost (where cost is defined as including a reasonable return on investment); is able to impose unreasonable terms and conditions on the purchase of a service or facility; controls access to a bottleneck facility or service; or is able to engage in unreasonably discriminatory practices; then that company/consortium may be presumed to possess market power. Congress should be aware that the level of competition may vary by market (*e.g.*, geographic area; retail versus wholesale) and can change over time. Competition is not guaranteed by the mere presence of more than one service provider in a market. Instead, the market power of the service provider(s) must be

assessed. For example, a duopoly that controls access to bottleneck facilities is unlikely to ensure a competitive marketplace.

For competition to develop, barriers to entry (and exit) must be relatively low – a situation which does not exist in key parts of the communications ecosystem such as the special access and local loop (the facility that connects the service provider and the end user premises) markets. For competition to flourish, and for businesses and consumers to benefit from that competition, Congress and the Federal Communications Commission (FCC) must adopt and enforce policies that promote effective and sustainable competition.

2. What principles should form the basis of competition policy in the oversight of the modern communications ecosystem?

Key principles must include:

- Nondiscriminatory interconnection and access to bottleneck facilities at just and reasonable rates, terms and conditions.
- Regulation should reflect market power - entities that possess market power should be subject to regulatory requirements which safeguard against abuse of that power; regulatory asymmetry among service providers may be appropriate given differing degrees of market power.
- Availability of a regulatory backstop to address competitive abuses or market failures at either the wholesale or retail level.
- Periodic review of the state of competition, including whether previous findings of competition/grants of forbearance from regulatory oversight, remain applicable.

3. How should intermodal competition factor into an analysis of competition in the communications market?

Effective intermodal competition is a critical element in an analysis of competition in the communications ecosystem, and policies should promote intermodal competition. In analyzing competition, Congress and the FCC should bear in mind the following elements:

- There is a difference between potential competition – the mere possibility of entities entering, or considering entering, a market with an entrenched incumbent – and effective, sustainable competition. The introduction of a new entrant or new mode of service delivery into an established market does not automatically negate or curb the market power of an existing service provider, and regulatory safeguards that protect and promote competition in a given market should not be lifted simply because of potential (rather than actual, sustainable) intermodal competition. Thus, for example, the fact that a cable company may offer Ethernet service in parts of city A does not mean that the incumbent local exchange carrier (such as AT&T or Verizon) lacks market power in the provision of Ethernet services in city A, or in cities X, Y and Z, or throughout its service territory.

- A communications service provider that has market power in one area has the ability and incentive to harm intermodal competition by leveraging that power to its advantage in another part of the ecosystem. A service provider that has disproportionate control over critical inputs relied upon by all competitors will be in a position to benefit its affiliates, and/or harm its competitors, elsewhere in the ecosystem.¹

- In many instances, the entrenched service provider has historic and/or on-going advantages, such as infrastructure constructed under a government-sanctioned monopoly franchise; favorable access to rights of way, conduits, and poles; government-sanctioned subsidies including decades of past (and

¹ See Sprint Corporation, “Competition: A Key Principle of Any Update to the Communications Act,” Response to “Modernizing the Communications Act,” White Paper (Jan. 31, 2014); Sprint Corporation, “Spectrum Policy: Sustainable Competition Should Be the Basis for Any Update to the Communications Act,” Response to “Modernizing U.S. Spectrum Policy,” White Paper (April 25, 2014).

likely future) explicit Universal Service Fund (USF) support, and implicit funding in the form of inflated, above-cost carrier access charges.. Such advantages can be powerful deterrents to market entry by a competitive service provider (both intermodal and intramodal).

- The increase in horizontal and vertical integration may result in new opportunities for anti-competitive activities. An integrated entity which has market power in one part of the communications ecosystem may use that market power to confer unreasonable advantages to its affiliates at the expense of unaffiliated entities in another part of the ecosystem.

4. Some have suggested that the FCC be transitioned to an enforcement agency, along the lines of the operation of the Federal Trade Commission, rather than use broad rulemaking authority to set rules a priori. What role should the FCC play in competition policy?

Sprint believes that the FCC has a critical role to play in both setting and enforcing national competition policies. It should remain the responsibility of the FCC to “put meat on the bones” of the very broad statutory imperatives established by Congress; national competition policies cannot be efficiently and effectively developed at the state or local level.

The FCC should also continue to engage in enforcement actions to identify, punish and deter unacceptable behavior, and to act as a “referee on the field” that addresses certain inter-carrier disputes. However, enforcement actions are possible only after the FCC has established rules and policies against which the regulated entities’ behavior and activities can be measured – a violation cannot be deemed to have occurred if no standards have been publicly articulated and adopted.

It is important to note that setting rules and competition policies *a priori* is vastly superior to attempting to regulate *a posteriori* via enforcement action. Rulemakings are generally applicable and prospective, while enforcement actions tend to be carrier-specific and after-the-fact. Rulemaking proceedings allow all interested parties to participate, to publicly discuss the costs, benefits, and technical/administrative feasibility of proposed rules prior to their adoption, and provide notice to affected parties of the need to implement compliance plans and the required scope of such compliance plans. In

contrast, an enforcement action (which is presumably initiated only in response to suspected violations of an established rule) is usually based on case-specific facts which may not be publicly known or which may not be generally applicable, and may involve consent decrees that are based in part on factors unrelated to the public interest. Moreover, in cases involving anti-competitive action by one company against another, the enforcement-only approach would not address the conduct until after the damage has already occurred, to the detriment of consumers and of competition.

5. What, if any, are the implications of ongoing intermodal competition at the service level on the Commission's authority? Should the scope of the Commission's jurisdiction be changed as a result?

Even where some intermodal competition exists, Congress should not eliminate the FCC's regulatory authority. The existence of intermodal competition in certain markets does not eliminate the need for all regulatory oversight. An entity that controls bottleneck facilities at any point in the communications ecosystem has an incentive to wrest supracompetitive concessions from competitors that rely on that facility, resulting in consolidation and the deterioration of once competitive markets. The FCC should have the ability to address such market failures. For example, more and more retail end users view wireless service as a viable alternative to their traditional wireline voice service. However, this does not mean that wireline service providers should be completely freed of their competition (or other public interest) obligations, since their control over wholesale last mile access facilities (on which wireless carriers depend) remains a source of market power.

6. What, if any, are the implications of ongoing intermodal competition on the role of the FCC in spectrum policy?

The FCC must analyze the potential effect its spectrum policy decisions have on supporting effective and sustainable competition. A significant component of this analysis should be the impact intermodal competition has on the type and quality of services carriers provide and how this competition

positively influences consumer choice. However, the FCC should not base its policy and licensing decisions on a preferred industry structure, instead ensuring that all competitors in the market do not face unnecessary regulatory obstacles and leaving it to the workings of the market to determine the optimal structure.

7. What, if any, are the implications of ongoing intermodal competition at the service level on the FCC's role in mergers analysis and approval?

Although the FCC's merger analysis traditionally begins with a market definition, it may also legitimately consider intermodal competition. The FCC's role and focus in a merger analysis may vary depending upon the type of intermodal competition involved. For example, if a wireline carrier proposes to merge with a wireless carrier, the FCC's justification for and interest in imposing conditions, as well as the type of conditions imposed, may be quite different than if a wireline carrier proposes to merge with a satellite or a cable company. In the former case, the FCC might choose to focus on the immediate competitive impact of the proposed merger (for example, whether the merged entity will have an enhanced ability to discriminate against non-affiliated wireless carriers). In the latter case, the FCC's focus might be on a different public interest consideration, such as universal service (for example, whether the merged entity would be in a better position to deploy broadband facilities in currently unserved areas).

8. Competition at the network level has been a focus of FCC regulation in the past. As networks are increasingly substitutes for one another, competition between services has become even more important. Following the Verizon decision, the reach of the Commission to regulate “edge providers” on the Internet is the subject of some disagreement. How should we define competition among edge providers? What role, if any, should the Commission have to regulate edge providers – providers of services that are network agnostic?

To encourage broadband investment and deployment, the Commission should make every effort to ensure that regulatory burdens imposed upon traditional common carriers do not unreasonably inhibit their ability to offer services which compete with those services provided by purely edge providers.

9. What regulatory construct would best address the changing face of competition in the modern communications ecosystem and remain flexible to address future change?

One of the FCC’s primary responsibilities is to promote and protect effective and sustainable competition. An effective and flexible regulatory construct in this regard will employ non-discrimination, interconnection, and other requirements commensurate with the level of competition in a given market and the amount of market power possessed by individual service providers. However, even in viably competitive markets, minimal oversight will remain necessary to address any competitive violations, and to protect and promote public interest goals (public safety, universal service, access by the disabled, etc.).

10. Given the rapid change in the competitive market for communications networks and services, should the Communications Act require periodic authorization by Congress to provide opportunity to reevaluate the effectiveness of and necessity for its provisions?

Congress should indeed evaluate the effectiveness of and necessity for the provisions of the Communications Act on a regular basis but should do so in a way that provides certainty to the marketplace by protecting the continuing nature of the Commission. An analysis of the state of competition in the communications market and the impact of the Act on the communications would be a

critical first step in considering whether or what updates to the Act would be in the public interest.

However, Congress should be cautious about requiring periodic authorizations, given the dangers of unintended lapses in re-authorization, and should especially avoid automatic sunsets, given the likelihood that circumstances will exist which warrant on-going competitive safeguards and oversight.

T-MOBILE USA, INC. RESPONSE TO HOUSE WHITE PAPER ON COMPETITION POLICY AND ROLE OF THE FCC

T-Mobile USA, Inc. (“T-Mobile”)^{1/} submits the following response to the White Paper released by the House Committee on Energy and Commerce (“Committee”) on May 19, 2014, seeking comment on U.S. competition policy and the role of the Federal Communications Commission (“FCC” or “Commission”), as a part of the Committee’s ongoing efforts to reform the Communications Act of 1934, as amended (the “Act”).^{2/}

I. INTRODUCTION

As the fourth largest wireless carrier in the United States, T-Mobile, including the MetroPCS brand, offers nationwide wireless voice, text, and data services to approximately 49.1 million subscribers and provides products and services through over 70,000 points of distribution.^{3/} T-Mobile is the fastest growing wireless company today, having added more than one million in total net customer additions over the past four consecutive quarters and having captured virtually all of the industry’s phone growth in the first quarter of 2014.^{4/} Our 4G Long-Term Evolution (“LTE”) network now reaches 220 million people in 284 metropolitan areas and is expected to reach more than 250 million people by the end of next year.^{5/}

^{1/} T-Mobile USA, Inc. is a wholly-owned subsidiary of T-Mobile US, Inc., a publicly traded company.

^{2/} See House Committee on Energy and Commerce, *Competition Policy and the Role of the Federal Communications Commission* (May 19, 2014) (“White Paper”), available at <http://energycommerce.house.gov/sites/repUBLICans.energycommerce.house.gov/files/analysis/CommActUpdate/20140519WhitePaper-Competition.pdf>; see also 47 U.S.C. § 151 *et seq.*

^{3/} See T-Mobile News Release, *T-Mobile US Reports First Quarter 2014 Results and Best Ever Quarterly Performance in Branded Postpaid Net Customer Additions* (May 1, 2014), available at <http://newsroom.t-mobile.com/news/t-mobile-us-reports-first-quarter-2014-results-and-best-ever-quarterly-performance-in-branded-postpaid-net-customer-additions.htm>.

^{4/} See *id.*

^{5/} See *id.*; T-Mobile News Release, *T-Mobile Celebrates 1st Anniversary of LTE Rollout By Launching Major Network Upgrade Program* (Mar. 13, 2014), available at <http://newsroom.t-mobile.com/phoenix.zhtml?c=251624&p=irol-newsArticle&ID=1908666&highlight=>.

T-Mobile supports the Committee's continued efforts to update the Act. As noted in our responses to the previous White Papers released by the Committee,^{6/} changes in technology and the structure of the communications industry favor a re-examination of the Act. We noted that the Act has struggled to keep up with technological developments and should therefore be refocused on promoting competition, eliminating barriers, and ensuring access and network interconnection capabilities, regardless of the technology a provider employs.^{7/} Similarly, in our response to the White Paper on modernizing spectrum policy, we discussed the importance of spectrum to competition and specifically recommended that Congress adopt, among other things, policies that would promote efficient use of federal spectrum and ensure that the FCC has the ability to reallocate and auction spectrum to its best and highest use.^{8/}

The most recent White Paper recognizes that technological convergence makes the development of competition policy more complex. It points out that the evolution of technology "has brought about the integration of voice, video, and data services across multiple platforms employing various technologies."^{9/} In light of these changes, Congress should ensure that the FCC maintains authority in areas where the agency has expertise without duplicating the activities of other federal entities such as the Department of Justice ("DOJ") and the Federal Trade Commission ("FTC"). Congress should not, however, as the White Paper asks, relegate the FCC to the limited role of an enforcement agency. In addition, Congress should allow the

^{6/} See T-Mobile USA, Inc. Response to House White Paper on Modernizing the Communications Act (filed Jan. 31, 2014) ("T-Mobile White Paper #1 Comments"), *available at* http://energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/analysis/CommActUpdate/WP1_Responses_91-100.pdf; T-Mobile USA, Inc. Response to House White Paper on Modernizing U.S. Spectrum Policy (filed Apr. 25, 2014) ("T-Mobile White Paper #2 Comments"), *available at* http://energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/analysis/CommActUpdate/WP2_Responses_43-58.pdf.

^{7/} See T-Mobile White Paper #1 Comments at 2-3.

^{8/} See T-Mobile White Paper #2 Comments at 18-19.

^{9/} White Paper at 1.

Commission to assess competition flexibly, permitting it to take a broader view of transactions when intermodal competition is involved. Finally, Congress must preserve wireless carriers' ability to manage traffic on their networks.

II. THE FCC HAS A MEANINGFUL ROLE IN COMPETITION POLICY

A. The Commission Should Have the Authority to Regulate in Order to Promote Competition.

The White Paper seeks comment on the principles that should form the basis of competition policy in the oversight of the modern communications ecosystem.^{10/} It also asks about the regulatory construct that would best address the evolving face of competition in the modern communications ecosystem while remaining flexible enough to address future changes.^{11/}

As it has stated before,^{12/} T-Mobile believes that the FCC should be authorized to take a light regulatory approach to the communications marketplace. The Commission should be permitted to regulate where it has special expertise and where the marketplace is not working effectively to address competitive issues.^{13/} For instance, FCC intervention may be necessary where industry participants have limited access to FCC-regulated resources, such as spectrum, roaming, and interconnection. In these areas, Congress should ensure that the Commission has the tools necessary to remedy market distortions and create a competitive and sustainable playing field.

First, the Commission should ensure an adequate supply of spectrum. As T-Mobile previously explained, spectrum is a finite resource, and, as demand for spectrum capacity rises,

^{10/} See *id.* at 2 (Question 2).

^{11/} See *id.* at 3 (Question 9).

^{12/} See, e.g., T-Mobile White Paper #1 Comments at 5.

^{13/} See *id.*; T-Mobile White Paper #2 Comments at 11-12.

sufficient spectrum must be available for carriers to compete.^{14/} The Commission recently agreed, noting that “spectrum is a limited and essential input for the provision of mobile wireless telephony and broadband services, and ensuring access to, and the availability of, sufficient spectrum is critical to promoting [] competition.”^{15/} Congress should also promote increased access to spectrum by retaining the FCC’s authority to repurpose spectrum, including spectrum already held by existing licensees, and to reallocate that spectrum to higher valued uses.^{16/} T-Mobile has similarly encouraged Congress to adopt policies that incentivize federal agencies to use their spectrum more efficiently so that additional spectrum may be made available for commercial use.^{17/} Increased access to spectrum resources will foster greater competition.

Second, roaming relationships may not occur on equal footing, necessitating regulatory intervention. As T-Mobile recently explained to the Commission,^{18/} real-world industry experience has demonstrated that wireless service providers continue to be stymied in their efforts to negotiate data roaming agreements on commercially reasonable terms, even though the

^{14/} See T-Mobile White Paper #1 Comments at 6.

^{15/} *Policies Regarding Mobile Spectrum Holdings, et al.*, WT Docket No. 12-269, *et al.*, FCC 14-63, ¶ 67 (rel. Jun. 2, 2014) (“*Mobile Spectrum Holdings Order*”).

^{16/} See T-Mobile White Paper #1 Comments at 5; T-Mobile White Paper #2 Comments at 8-9.

^{17/} See T-Mobile White Paper #2 Comments at 6-8; *see also* Comments of T-Mobile USA, Inc., Docket No. OSTP-2014-0002-0001 (filed Mar. 20, 2014), *available at* http://www.whitehouse.gov/sites/default/files/microsites/ostp/rfi_responses_-_fr_doc._2014-03413_filed_2-14-14_all.pdf.

^{18/} See Petition for Expedited Declaratory Ruling of T-Mobile USA, Inc., WT Docket No. 05-265, at 5-9 (filed May 27, 2014) (“T-Mobile Data Roaming PDR”); Comments of T-Mobile US, Inc., WT Docket No. 13-135, at 21-22 (filed June 17, 2013) (“T-Mobile Wireless Competition Comments”); Reply Comments of T-Mobile US, Inc., WT Docket No. 13-135, at 17-18 (filed July 25, 2013) (“T-Mobile Wireless Competition Reply Comments”); *see also Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services*, Sixteenth Report, 28 FCC Rcd. 3700, ¶ 210 (2013) (“*Sixteenth Wireless Competition Report*”) (“Several providers have stated that, although the Commission adopted the *Data Roaming Order* in 2011, the ability to negotiate data roaming agreements on non-discriminatory terms and at reasonable rates remains a concern.”).

Commission has adopted rules to facilitate these negotiations.^{19/} The growing dominance of certain carriers has substantially exacerbated this problem.^{20/} The Commission must therefore continue to have the authority to intervene when required to ensure the competitive provision of essential roaming services,^{21/} including by adopting predictable enforcement criteria while still leaving providers with room for variation in negotiating roaming agreements.^{22/}

Third, as T-Mobile previously suggested to the Committee, the Commission should retain its authority to oversee competitive interconnection (and other inter-provider) arrangements as the Internet Protocol (“IP”) transition occurs.^{23/} Today, incumbent local exchange carriers control tens of thousands of legacy points of interconnection, skewing the market in their favor and creating bottlenecks for competitive access to IP networks.^{24/} In order to prevent these carriers from engaging in anti-competitive behavior with respect to their networks, Congress must provide the Commission with the regulatory tools it may need to facilitate IP interconnection relationships on reasonable terms and conditions.^{25/}

^{19/} See *Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, Second Report and Order, 26 FCC Rcd. 5411, ¶¶ 40-41 (2011) (“*Data Roaming Order*”), *aff’d sub nom. Cellco P’ship v. FCC*, 700 F.3d 534 (D.C. Cir. 2012).

^{20/} See T-Mobile Data Roaming PDR at 7.

^{21/} See *Data Roaming Order* ¶ 77 (“When roaming-related complaints or petitions for declaratory ruling are filed, we intend to address them expeditiously.”); *id.* ¶¶ 80, 84; see also T-Mobile White Paper #1 Comments at 6-7.

^{22/} See T-Mobile Data Roaming PDR at 25-27.

^{23/} See T-Mobile White Paper #1 Comments at 6-7; see also Comments of T-Mobile USA, Inc., GN Docket No. 12-353, at 9-17 (filed Jan. 28, 2013) (“T-Mobile IP Interconnection Comments”); Reply Comments of T-Mobile USA, Inc., GN Docket No. 12-353, at 3-10 (filed Feb. 25, 2013); T-Mobile Wireless Competition Comments at 23-24; T-Mobile Wireless Competition Reply Comments at 19-21.

^{24/} See T-Mobile IP Interconnection Comments at 9-10.

^{25/} See *id.* at 9-11.

B. The Commission Should Not Be Relegated to an Enforcement Agency.

The White Paper notes that some parties have suggested that the FCC be transitioned to an enforcement agency rather than use broad rulemaking authority to set rules *a priori*.^{26/} It therefore asks what role the FCC should play in competition policy. In order to be most effective in the areas discussed above, the FCC should have the authority to regulate prescriptively; its role should not be limited to enforcement.

For example, *ex-ante* roaming and interconnection rules are more effective than *ex-post* enforcement actions. Clear rules of the road better enable carriers and others to engage in careful business planning and encourage commercially reasonable, arms-length negotiations. Upfront rules are particularly important when there are chokepoints in a market since competitive entities may be completely shut out of a market by a dominant carrier before the FCC can take any enforcement action.^{27/} Congress should therefore refrain from reducing the FCC's role to simply an enforcement agency.

III. TECHNOLOGICAL CONVERGENCE REQUIRES A RE-EVALUATION OF THE ANALYTICAL APPROACH TO COMPETITION

The White Paper seeks comment on the definition of competition in the modern communications market and how Congress can ensure that the definition is flexible enough to accommodate the rapidly changing industry.^{28/} It also requests input on how intermodal competition should factor into an analysis of competition in the communications market^{29/} and

^{26/} See White Paper at 3 (Question 4).

^{27/} See Reply Comments of T-Mobile USA, Inc., WT Docket No. 13-301, at 9-10 (filed May 16, 2014) (explaining that providers of mobile communications onboard aircraft must be subject to upfront roaming and other requirements to ensure that these handful of providers do not engage in anti-competitive behavior to exclude new market participants).

^{28/} See White Paper at 2 (Question 1).

^{29/} See *id.* at 3 (Question 3).

how ongoing intermodal competition impacts the FCC’s authority and its role with respect to spectrum policy and merger analysis and approval.^{30/}

T-Mobile agrees that the Act should preserve the FCC’s ability to analyze competition where it has expertise and that the Commission’s authority must be flexible enough to consider intermodal competitors. As the Commission recently explained, it is required to balance a number of statutory objectives in designing its rules regarding spectrum licenses and the competitive bidding assignment process.^{31/} Pursuant to that authority, the Commission affirmed that it will continue to use its two-part initial screen and case-by-case review of wireless transactions.^{32/} First, the Commission will examine the market concentration that would result from a transaction, as measured by the Herfindahl-Hirschman Index.^{33/} Second, the Commission will identify markets where an entity would hold more than approximately one-third of the total spectrum suitable and available for the provision of mobile telephony/broadband services.^{34/} Moreover, the Commission will now treat further concentrations of below-1 GHz spectrum as an “enhanced factor” in its case-by-case analysis.^{35/}

However, spectrum holdings may not be the most important basis for evaluating all transactions, particularly when there is strong intermodal competition. As T-Mobile previously

^{30/} See *id.* (Questions 5, 6, and 7).

^{31/} See *Mobile Spectrum Holdings Order* ¶ 44.

^{32/} See *id.* ¶¶ 44-45; 231-232; see also *Applications of Cricket License Company, LLC, et al., Leap Wireless International, Inc., and AT&T Inc. for Consent To Transfer Control of Authorizations; Application of Cricket License Company, LLC and Leap Licenseco Inc. for Consent to Assignment of Authorization*, Memorandum Opinion and Order, 29 FCC Rcd. 2735, ¶ 41 (2014) (“*AT&T/Leap Order*”); *Applications of SOFTBANK CORP., Starburst II, Inc., Sprint Nextel Corporation, and Clearwire Corporation for Consent to Transfer Control of Licenses and Authorizations, et al.*, Memorandum Opinion and Order, Declaratory Ruling, and Order on Reconsideration, 28 FCC Rcd. 9642, ¶ 34 (2013) (“*Sprint/SoftBank/Clearwire Order*”).

^{33/} See *AT&T/Leap Order* ¶¶ 21, 41; *Sprint/SoftBank/Clearwire Order* ¶ 34.

^{34/} See *AT&T/Leap Order* ¶ 41.

^{35/} See *Mobile Spectrum Holdings Order* ¶ 267.

pointed out and the White Paper recognizes, mobile voice services both complement and compete with wireline services, with mobile wireless services continuing to displace legacy wireline services at a steady pace.^{36/} The Commission has likewise recognized that mobile wireless services, among others, are beginning to satisfy the video demands once met only by traditional television services.^{37/} This trend in intermodal competition is only expected to grow, continuing to blur the lines between different services.^{38/}

As providers begin to offer the same services over different platforms, a wider range of competitors must be considered in assessing the competitive landscape. The Act must provide the Commission with authority to flexibly define competition and product markets based on technical convergence and review transactions involving intermodal competition from a consumer perspective. For example, in transactions where providers from historically different communications sectors – e.g., wireless service carriers, satellite service providers, cable operators, etc. – seek to integrate their services, the Commission should have the ability to analyze the proposed transaction’s broader impact on consumer prices and offerings. The

^{36/} See T-Mobile Wireless Competition Comments at 27-28; White Paper at 1; see also *Sixteenth Wireless Competition Report* ¶¶ 365-367.

^{37/} See T-Mobile White Paper #1 Comments at 2 (citing *Sixteenth Wireless Competition Report* ¶ 262); see also White Paper at 1-2 (citing *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, Fifteenth Report, 28 FCC Rcd. 10496 (2013)) (discussing the shift in multichannel video programming distributor (“MVPD”) subscribers from cable operators to Direct Broadcast Satellite MVPDs and telephone MVPDs).

^{38/} See, e.g., Douglas MacMillan and Ryan Knutson, *Sprint Chairman Makes Case for T-Mobile Deal*, WALL ST. J. (May 28, 2014), available at http://online.wsj.com/articles/sprint-chairman-makes-case-for-t-mobile-deal-1401303682?mod=WSJ_TechWSJD_NeedToKnow (quoting Masayoshi Son, Chairman of Sprint Corp.) (“Right now, there are three big players out there, and they are getting even bigger.”); *id.* (adding that the “three big players” referred to by Mr. Son include the \$49 billion acquisition of satellite broadcaster DirecTV by AT&T Inc.; the \$45 billion purchase of Time Warner Cable by Comcast Corp.; and the \$130 billion deal by Verizon Communications, Inc. to purchase Vodafone Group PLC’s interest in their U.S. wireless joint venture); see also AT&T Press Release, *Mobilizing the Sky: AT&T Building 4G LTE In-Flight Connectivity Service* (Apr. 28, 2014), available at http://about.att.com/story/mobilizing_the_sky_att_building_4g_lte_in_flight_connectivity_service.html (reporting that AT&T is planning to enter the market for in-flight mobile connectivity).

Commission's evaluation of the transaction should depend on whether it will create an impermissible level of power or market concentration for services provided to consumers – regardless of how those services are delivered. The overall scale, dominance, and market power of these transactions should be analyzed, not simply spectrum holdings.

However, the Commission's role in evaluating competition – whether in the context of transactions or prescriptively – must not be unbounded, particularly in light of the roles that the DOJ and FTC have in evaluating competition. While those entities work closely with the FCC,^{39/} greater definition of each participant's role would be in the public interest so that overlapping activities are minimized. Nevertheless, in defining responsibilities, the Commission's expertise in matters such as spectrum and technological bottlenecks must continue to be recognized.

IV. MARKET CONDITIONS SHOULD GOVERN RELATIONSHIPS BETWEEN NETWORK OWNERS AND NETWORK USERS

Recognizing that networks are increasingly substitutes for one another, the White Paper notes that competition between services has become even more important and asks how competition should be defined among edge providers.^{40/} The White Paper also asks what role, if any, the Commission should have to regulate edge providers.

As the Commission has pointed out, the Internet has become our Nation's most important platform for economic growth, innovation, and competition.^{41/} Much of the success of the

^{39/} See, e.g., *AT&T/Leap Order* ¶ 15 (noting that the FCC's competitive analysis is informed by traditional antitrust principles and that the Commission and the DOJ each have independent authority to examine the competitive impacts of proposed communications mergers and transactions, but that the standards governing the Commission's competitive review differ somewhat from those applied by the DOJ).

^{40/} See White Paper at 3 (Question 8).

^{41/} See *Protecting and Promoting the Open Internet*, Notice of Proposed Rulemaking, GN Docket No. 14-28, FCC 14-61, ¶ 1 (rel. May 15, 2014).

Internet was born from light touch regulation. Indeed, the Internet’s openness has created a “virtuous circle” of innovation in which new uses of the network – including new content, applications, services, and devices – create demand for Internet services, which in turn drives the deployment of broadband infrastructure through which consumers seek access to further innovative network uses.^{42/} In order to maintain this growth, Congress should retain a regulatory framework that generally allows market conditions to govern the operations of network owners and their relationships with edge providers and consumers.

Specifically, network owners must have the flexibility to manage their traffic in order to create the experience for which consumers pay. As T-Mobile has previously noted, the unique characteristics of wireless systems require wireless network owners to employ reasonable network management practices, not only to relieve unnecessary congestion, but also to protect against network security threats and unforeseen vulnerabilities; network integrity, “noise” concerns, and other technical challenges; consumer privacy concerns; and unexpected usage patterns that degrade service irrespective of the bandwidth used.^{43/} If left unaddressed, these challenges can harm consumers and substantially degrade service quality. Congress should continue to recognize, and ensure that the Commission has the authority to recognize, that wireless carriers need to manage their traffic differently than other providers.

^{42/} See *id.* ¶ 26.

^{43/} See Reply Comments of T-Mobile, GN Docket No. 09-191, at 3 (filed Nov. 4, 2010); see also T-Mobile White Paper #1 Comments at 4 (explaining that “wireless providers must have the necessary network management tools, including usage-based pricing, traffic shaping, and others, to ensure a high-quality consumer experience and the safety and integrity of their networks”).

V. CONCLUSION

T-Mobile appreciates the Committee's continued efforts to modernize the Communications Act. In addition to its earlier recommendations regarding general updates to the Communications Act, T-Mobile urges Congress to carefully consider the proposals above as it evaluates the Nation's competition policies. T-Mobile looks forward to continuing to work with the Committee on these important matters.

June 13, 2014

June 13, 2014

Comment on the Communications Act update

Distinguished members of the House Energy & Commerce Committee:

Listed below are questions and answers for submission from the Taxpayers Protection Alliance regarding the pending update to the Communications Act.

1. How should Congress define competition in the modern communications marketplace? How can we ensure that this definition is flexible enough to accommodate this rapidly changing industry?

The world has advanced in many ways as it relates to communications and commerce. This is a global age and any update to the Communications Act must take this into account. The way in which Congress chooses to define competition in the communications marketplace must be broad, but must also ensure that the definition is equally applied so that any and all changes in technology can be fully acclimated to the new framework. Another reason why a broad definition should be applied when updating the Communications Act is because many industry players are no longer limited in terms of their focus on the communications marketplace, and they provide a range of services and products for all consumers. This will also provide security for consumers who have an array of options to choose from when it comes to the marketplace. Congress should stay away from anything that may pick and choose winners or losers in the marketplace. Congress should ensure equal treatment of options (technologies, providers, etc.). A broad definition will ensure adaptability for those participating in the marketplace, and preserve free-market competition for all involved.

2. What principles should form the basis of competition policy in the oversight of the modern communications ecosystem?

Competition policy in the oversight of any update to the Communications Act should set forth some key principles to ensure that all involved can participate in a fair and open system. Limited regulations, competition and innovation should be able to thrive and not be held down by unneeded regulatory burdens. One federal agency should be in charge when it comes to enforcing rules that govern the communications marketplace as opposed to multiple agencies that increase the chance of hindering growth and competition.

3. How should intermodal competition factor into an analysis of competition in the communications market?

**Taxpayers Protection Alliance, 108 N. Alfred Street, Lower Level, Alexandria,
Va. 22314 (703) 229-0254
www.protectingtaxpayers.org**

The rules that are applied to all providers should be applied equally in the communications marketplace. While intermodal competition is important in terms of evaluating where the industry is from a competition standpoint, the best way to measure competition is to take into account all the services and products from all providers.

4. Some have suggested that the FCC be transitioned to an enforcement agency, along the lines of the operation of the Federal Trade Commission, rather than use broad rulemaking authority to set rules a priori. What role should the FCC play in competition policy?

As stated in question #2, jurisdiction for oversight and enforcement must be kept to one single agency, this will ensure a more efficient process and limit any confusion or turf war between federal regulators. The Federal Trade Commission (FTC) already possesses a wide range of experience when it comes to protecting consumers in the communications marketplace, and they will be equipped to provide any and all framework necessary for enforcement. With a clear, defined goal that safeguards the interests of consumers, the FTC should be able to protect all consumers in the communications marketplace equally, regardless of which provider, manufacturer, or developer.

6. What, if any, are the implications of ongoing intermodal competition on the role of the FCC in spectrum policy??

The role of the Federal Communications Commission (FCC) should be one that is focused on technical aspects related to spectrum in transactions. Spectrum is important to encouraging more innovation and providing greater consumer satisfaction in the communications marketplace.

7. What, if any, are the implications of ongoing intermodal competition at the service level on the FCC's role in mergers analysis and approval?

The authority for merger review should left in the hands of the Department of Justice and FTC, not the FCC. There shouldn't be attempts by the FCC to leverage "consumer interest standard" in order to obtain any concession(s) from those involved in mergers.

9. What regulatory construct would best address the changing face of competition in the modern communications ecosystem and remain flexible to address future change?

Citizens should be concerned that any new legislation or update to any old legislation will provide an opportunity to create more regulations and harm industries that thrive off of the investment and innovation of the private sector. Any framework or construct should preserve equal treatment to technologies and no regulatory approach should favor or burden a specific industry, provider, technology, or developer. Those who are involved in the process at the stakeholder level should also be involved in helping to create and refine the guidelines that will govern the regulatory approach. Government interference should be limited to only when there is recognition of harm being done to consumers or the competitive market. And, any intervention by government should be response specific, so as to avoid any sweeping overreach or action.

10. Given the rapid change in the competitive market for communications networks and services, should the Communications Act require periodic reauthorization by Congress to provide opportunity to reevaluate the effectiveness of and necessity for its provisions?

Yes, this is absolutely imperative to maintaining the integrity of competition in the communications marketplace. A congressional reauthorization of the Communications Act would not only be helpful in indentifying the effectiveness of provisions, it would also provide opportunities to introduce new ways to encourage further innovation and increased competition in the communications marketplace. All providers and developers can be assured that any new advancements in technology will not be left behind waiting for Congress to act. With a periodic examination of the benefits and impacts of provisions in the Communications Act, there will be no doubt that standards will keep pace with technology. The only caveat is that Congress should not use reauthorizations as a reason to increase regulations or taxes.

Thank you,



ms

President
Taxpayers Protection Alliance



Letter

To: Chairman Greg Walden, Communications and Technology Subcommittee,
United States House of Representatives
From: Hans Peter Bech, TBK Consult Holding ApS, Strandvejen 724, 2930
Klampenborg, Denmark, hpb@tbkconsult.com
Date: June 6, 2014
Subject: Competition policy and updating the Communications Act

Dear Mr. Walden,

Thank you for the opportunity to provide input for the revision of the US Communications Act.

Please allow me to provide a perspective as someone from outside the communications industry. I am the CEO of a company that is dependent on access to Internet based services with increasing bandwidth, accessibility and at a steadily improved price/performance ratio.

Recently, I delivered a series of workshops on international business development for a group of Turkish software industry executives in Istanbul, Turkey. The workshops were sponsored by the Turkish Ministry of Economy and organized by the Turkish Exporters Association.

I happen to use videos in my training material. These videos are all hosted on YouTube. One of the videos is with Steve Blank, a US based expert on technology innovation and startups.

On a Wednesday in April as I was delivering a presentation to 20 software industry executives in Istanbul the videos suddenly wouldn't play. The Turkish government had decided to block access to a number of US based services delivered through the Internet. YouTube was one of them.

I was unable to deliver my lectures as planned and Steve Blank didn't get the promotion he would have enjoyed.

Later the same day I was preparing some internal communication to be posted on our Intranet, which is based on Google Sites. Due to Internet access restriction imposed by the Turkish government I couldn't get access to Google Sites. I had to wait until I was outside of Turkey before I could post my message on our Intranet.

My two examples show that in a world where software and content are delivered through the Internet, free trade is easily impacted by erratic political measures jeopardizing the commercial interests of private enterprises.

The growth of businesses delivering services and content through the Internet (irrespective of the underlying "transport" technology) is dependent on steadily increasing "transportation" bandwidth and declining "transportation" cost. Based on my Turkish experiences we can also add unrestricted access.

I run a small consulting company with operations in Europe and the USA. My company is operated through a cloud-based infrastructure using LinkedIn, XING, Facebook, Twitter, Vimeo, YouTube and Google for promotional purposes. We use Basecamp, Highrise, XERO, Billys' Billing, 14Dayz, Skype, WebEx and Google Apps as our operational platforms. The bottom line is that without a well performing, affordable and accessible Internet we cannot function. We will become unable to serve our clients and we will not be able to give business to our suppliers.

I enthusiastically welcome the initiative taken by the House Energy and Commerce Committee Chairman Fred Upton and Communications and Technology Subcommittee Chairman Greg Walden to reform the Communications Act of 1934. The overall objective must be to maintain the incentives for private enterprises to keep investing in a steadily improving capacity of the Internet while securing a healthy competitive environment driving down the price/performance ratios.

The market for services and content delivered through the Internet is truly global. However, the EU and US are caught up in an irrational discussion of net neutrality that unfairly focuses on Internet service providers.

The real threats to Internet freedom are not companies who have to live by market forces, but rather governments, which in many countries routinely block content and services. As such, I believe the US Congress needs to be careful about giving the FCC too much power to regulate the Internet. The best policy is to make a single regulatory framework for all communications providers. If there are to be net neutrality rules, then they have to be applicable to all players in the Internet value chain.

Keeping in mind the Communications Act and encouraging competition, the objective is to make a level playing field for all Internet and communications services. This means retiring obsolete regulatory silos for different communications services. The same laws and standards need to apply to all players, whether operators or over the top providers. A simplified, standardized, consistent, and transparent framework is best for competition, industry, and consumers.

The market led, technology neutral approach is the best method to support the competition on which my and million of other small businesses depend.

Yours sincerely

Hans Peter Bech
CEO



International Center
for Law & Economics

The Honorable Fred Upton
Chairman
Energy and Commerce Committee
U.S. House of Representatives
2183 Rayburn House Office Building
Washington, DC 20515

The Honorable Greg Walden
Chairman
Communications and Technology Subcommittee
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2182 Rayburn House Office Building
Washington, DC 20515

Re: Response to White Paper #3

Dear Chairman Upton and Chairman Walden,

TechFreedom and the International Center for Law and Economics (ICLE) respectfully submit the following comments in response to the Committee's third white paper in its examination of how communications law can be rationalized to address the 21st century communications landscape.

We applaud your attention to these important issues and we look forward to assisting the Committee in any way we can to advance the enactment of a communications law for the digital age.

/s/ Geoffrey A. Manne, ICLE

/s/ Berin Szoka, TechFreedom

/s/ Ben Sperry, ICLE

/s/ Tom Struble, TechFreedom

ICLE & TECHFREEDOM COMMENTS ON COMMUNICATIONS ACT REWRITE REQUEST FOR COMMENTS

Competition Policy and the Role of the FCC

For many years, government regulation assumed clear, stable boundaries between industries and markets. This assumption sometimes prompted regulators to view (and to regulate) firms in various industries differently, even when they offered similar services. It also caused regulators to address the threat of anticompetitive conduct on the part of some firms by barring them from certain industries and markets.

The time has come for another approach. Even if the lines between industries and markets were clear in the past, technological and market changes are now blurring them beyond recognition, if not erasing them entirely. Regulatory policies predicated on such perceived distinctions can harm consumers by impeding competition and discouraging private investment in networks and services. The Administration is therefore committed to removing unnecessary and artificial barriers to participation by private firms in all communications markets....

This was not the rhetoric of the Bush Administration or its FCC Chairmen, but the guiding vision of the Clinton Administration — the core of the “Telecommunications Policy Reform Initiative” released in January 1994.¹ Well before Newt Gingrich’s “Republican Revolution” swept into power, President Clinton and Vice President Gore were trying to clear the regulatory dead wood of the analog era and pave the way for competition in an era of convergence. Whatever the faults of their approach, which would have been Telecommunications Act of 1994, its basic thrust – against regulatory formalism – was right.

Unfortunately, while the Telecommunications Act of 1996 did do much to clear the way for competition within sectors of the telecommunications industry, it preserved

¹ White House Office of Commc’ns, Background on Telecommunications Policy Reform Initiative, 1994 WL 9916 (1994).

the outdated silos of voice, video, terrestrial broadcast, satellite broadcast, wireless, “information” services, and so on. Shortly after President Clinton signed the 1996 Act, John Podesta offered a particularly damning — and sadly prescient — initial assessment:

Technology, and especially the Internet, is about to sweep past this legislation and make it obsolete.... Congress failed to understand the potential of the Net to deconstruct the existing industry structure. Aside from hooking up schools and libraries, and with the rather major exception of censorship, Congress simply legislated as if the Net were not there.²

Podesta, who had been a senior advisor to the President on telecom issues and who would soon thereafter return to the White House and, eventually, become President Clinton’s Chief of Staff, expressed the frustration of the New Democrats who had tried to clear the way for competition, just as Alfred Kahn had, under President Carter, cleared the way for airline competition by dismantling the Civil Aeronautics Board.³

Bill Kennard, President Clinton’s second FCC Chairman, tried to make the most of the contorted and baroque statute Congress gave the agency by setting in motion most of the deregulation that made possible the services we take for granted today. Yet there was only so much he could do within the formalist confines of the Act. So, in 1998, he explained his intention to do the other thing an FCC Chairman could do without Congress: re-organize the structure of the agency along functional lines, rather than by industry silos:

At the very least, as competition develops across what had been distinct industries, we should level the regulatory playing field by leveling regulation down to the least burdensome level necessary to protect

² John D. Podesta, *Unplanned Obsolescence: The Telecommunications Act of 1996 Meets the Internet*, 45 DEPAUL L. REV. 1093 (1996).

³ See THOMAS K. MCCRAW, *PROPHETS OF REGULATION: CHARLES FRANCIS ADAMS, LOUIS D. BRANDEIS, JAMES M. LANDIS, ALFRED E. KAHN* (1986).

the public interest. Our guiding principle should be to presume that new entrants and competitors should not be subjected to legacy regulation. This is not to say that different media, with different technologies, must be regulated identically. Rather, we need to make sure that the rules for different forms of media delivery, while respecting differences in technology, reflect a coherent and sensible overall approach. To the extent we cannot do that within the confines of the existing statute, we need to work with Congress and others to reform the statute.⁴

This was the most diplomatic way an FCC Chairman could tell Congress that it needed to go back to the drawing board and start over. Yet here we are, twenty years after Clinton and Gore called for a technologically neutral communications act, and sixteen years after Kennard said the same thing — still watching the FCC struggle to apply the 1996 Act in a world that looks nothing like its basic assumptions, and where voice, video and information have become applications delivered over radically different platforms.

The Outdated Competition Policy of the 1996 Act and its Precursors

It is important to recall the purposes of the 1996 Act and the role of competition policy within it. At the time, the central competition issue for communications law and policy was viewed as the facilitation of entry into long-distance and enhanced telephony markets following the breakup of AT&T and the implementation of the court order (the “MFJ”) regulating the resulting BOCs.⁵ In the most important respects the central purpose of the 1996 Act was mandatory unbundling — facilitating entry on the assumption that new entrants couldn’t build new infrastructure to compete with incumbent carriers. Much of the Act’s approach to competition policy flows from that purpose.

But today we face a very different marketplace. Perhaps (although the jury is still out) *because* of the competition policy aims of the 1996 Act, competitive constraints

⁴ FCC, *A New Federal Communications Commission for the 21st Century*, I-D (1999), available at <http://transition.fcc.gov/Reports/fcc21.html> [hereinafter “Kennard Strategic Plan”].

⁵ See Podesta, *supra* note 2, at 1104-08.

on network (particularly last-mile network) market power abound. We have shifted from a world where simplistic structural regulations aimed at mandating interconnection (and/or impeding vertical integration) by price-regulated, monopolist networks makes some economic sense, to a more complicated world in which both the causes and effects of market power are far more ambiguous. Resolution of today's competitive issues doesn't turn on simply facilitating new entry, but on adjudicating complex disputes over a wide range of both horizontal and vertical relationships among sophisticated players, all possessing market power, bargaining advantages and technological supremacy in varying and uncertain degrees. In other words, while infrastructure competition is important, the heavy lifting in FCC competition policy today concerns significantly different and more nuanced issues than those at the core of the existing regulatory framework.

The 1996 Act focuses heavily on vertical relationships and the threats to competition that can arise from (regulated) monopolists' extensions into complementary markets. The *Hush-a-Phone* and *Carterfone* disputes of the Ma Bell era centered on AT&T's attempts to control complementary markets, and eventually gave rise to the divestiture of the BOCs and the MFJ that governed them and mandated structural separation, the FCC's *Computer Inquiries* of the 1970s and 1980s, and ultimately the 1996 Act. Compared to the previous regulatory frameworks, the 1996 Act is somewhat "deregulatory," insofar as it eschews strict structural separation for what amount to, largely, conduct regulations.

Yet even the allegedly deregulatory 1996 Act takes an inherently structural view. While it eschews the strict structural *separation* of the MFJ, it nevertheless adopts the same, strict structural framework, imposing extensive unbundling and interconnection (access) requirements on infrastructure providers on the assumption that entry into complementary markets requires specific restraints based on formalistic distinctions between price-regulated infrastructure and complementary services. Whether or not that makes sense for the telecommunications services regulated under Title II, the extension of those presumptions to non-price-regulated broadband

services makes no sense at all.⁶

Moreover, the 1996 Act's formalism isn't limited to vertical structures. Rather, it contemplates competition only within its specified technological silos, and does not readily accommodate the intermodal competition that characterizes today's communications ecosystem. Thus, where wireless service competes with wireline service, VoIP provides the same functionality as wireline and wireless telephony, and where IP video challenges cable television, the regulatory structure of the 1996 Act is out of sync with the markets it now governs.

The 1996 Act thus incorporates at least two basic, formalistic premises that underpin its approach to competition issues:

1. First, competitive concerns arise from anticompetitive extensions of monopoly power by operators of the core physical layer into the provision of various services connected to it, where "network" and "services" are inherently distinct and where the overriding concern is for competition in services, not the physical networks.
2. Second, competitive concerns are essentially *intramodal*, arising from the divergent incentives of incumbent providers and new entrants, on the one hand, and affiliated and unaffiliated services on the other, all operating upon the same underlying technology.

Unfortunately, these presumptions are overly rigid given current market realities. VoIP presents perhaps the simplest example of the failings of such rigidity. While VoIP is decidedly an application running atop IP-enabled physical infrastructure, it offers functionality that is essentially identical to that provided by the public switched telephone network. Meanwhile, while cable ISPs offer VoIP services

⁶ We have discussed this issue at length in our filings in the IP Transition docket. See Starr, Manne & Szoka, Toward Modern Modest Regulation for the IP Transition, Comments, In the Matter of the Technological Transition of the Nation's Communications Infrastructure, GN Docket No. 12-353 (January 28, 2013), *available at* <http://apps.fcc.gov/ecfs/document/view?id=7022113680>; Manne, Starr, Szoka & Downes, How the FCC Can Lead the Way to Internet Everywhere by Enabling the IP Transition, Reply Comments, In the Matter of the Technological Transition of the Nation's Communications Infrastructure, GN Docket No. 12-353 (February 25, 2013), *available at* <http://apps.fcc.gov/ecfs/document/view?id=7022125022>.

through channels dedicated to their proprietary cable networks, unaffiliated VoIP providers offer identical services over the public Internet channels and/or wireless networks. And at the same time, cable-network VoIP services have significantly eroded the market share of ISDN telephony and POTS running on switched copper networks, and wireless telephony has further eroded the dominance of all of these wireline telephony services.

One attribute of the current regulatory framework, as suggested above, is that it is more concerned with preserving and favoring innovation and competition in the applications/content market, rooted in the assumption that network/infrastructure monopolies threaten that market's competitiveness. Concomitantly, the framework is little concerned with innovation and competition in network/infrastructure markets. But this emphasis is ill-supported in today's marketplace, and the focus on edge provider innovation to the exclusion of network innovation (and investment incentives) that permeates the Net Neutrality debate, for example, is in part a symptom of this residual myopia.

In the first place, this emphasis is inconsistent with basic economic logic, which counsels in favor of focusing regulatory attention on increasing competition in the *least* competitive segment of a vertical structure. As Prof. Christopher Yoo has noted:

One of the basic tenets of vertical integration theory is that any chain of production will only be as efficient as its least competitive link. As a result, competition policy should focus on identifying the link that is the most concentrated and the most protected by entry barriers and design regulations to increase its competitiveness. In the broadband industry, the level of production that is the most concentrated and protected by barriers to entry is the last mile. This implies that decisions about Internet regulation should be guided by their impact on competition in that portion of the industry.⁷

⁷ Christopher S. Yoo, *Beyond Network Neutrality*, 19 HARV. J.L. & TECH. 1, 8 (2005), available at <http://jolt.law.harvard.edu/articles/pdf/v19/19HarvJLTech001.pdf>.

Undoubtedly there is less competition among infrastructure providers and ISPs than among content providers. But, as Net Neutrality advocates implicitly insist, the 1996 Act (and especially its Title II provisions) aims at preserving and maximizing competition in the most competitive sector of the stack, and essentially assumes the absence of or need for innovation and competition in the network.

Undoubtedly this is in part a function of the Act's design — a design predicated on government-guaranteed, rate-regulated, monopoly infrastructure. But in broadband (and increasingly in telecommunications), this presumption is unwarranted. While infrastructure is certainly less competitive than content, it is becoming increasingly so, and the infrastructure used for broadband is not rate regulated. We are ill-served by appealing to the Act's presumption that network competition is hopeless. Instead, we would do better to focus on removing direct barriers to competition, both wireline and wireless.⁸ And for our competition policy, as Yoo further notes:

[P]ublic policy would be better served if Congress and the FCC were to embrace a "network diversity" principle that permits network owners to deploy proprietary protocols and to enter into exclusivity agreements with content providers.

* * *

Intervening by mandating network neutrality would have the inevitable effect of locking the existing interfaces into place and of foreclosing experimentation into new products and alternative organizational forms that transcend traditional firm boundaries.

The decision to permit network diversity to emerge, then, does not necessarily depend on a conviction that it would yield a substantively

⁸ We will also file comments on this topic in response to the FCC's inquiry regarding promoting broadband deployment, focusing on the agenda laid out by the National Broadband Plan: opening more spectrum to serve consumers and facilitating deployment of infrastructure by both wireless and wireline providers, especially through more rational local infrastructure policy. See, e.g., Berin Szoka, et al., Don't Blame Big Cable. It's Local Governments that Choke Broadband Competition, WIRED (July 16, 2013), available at <http://wired.com/opinion/2013/07/we-need-to-stop-focusing-on-just-cable-companies-and-blame-local-government-for-dismal-broadband-competition/>.

better outcome, but rather from a “technological humility” that permits exploration to proceed until policymakers can make a clearer assessment of the cost-benefit tradeoff.⁹

Moreover, it is not even clearly the case that content markets *themselves* are best served by being directly favored to the exclusion of infrastructure. The two markets are undoubtedly symbiotic, in that gains for one inevitably produce gains for the other (i.e., increasing quality/availability of applications/content drives up demand for broadband, which provides more funding for networking infrastructure, and increased bandwidth enabled by superior networking infrastructure allows for even more diverse and innovative applications/content offerings to utilize that infrastructure). Absent an assessment of actual and/or likely competitive effects, it is impossible to say *ex ante* that consumer welfare in general, and regarding content in particular, is best served by policies aimed at encouraging innovation and investment in one over the other. Given such uncertainty, the rigid presumptions of the existing Act are a poor fit for regulation of broadband and the applications that rely on it.

In short, as a former advisor to both Chairman Kennard and Chairman Hundt put it:

Broadband—and IP-based services more generally—attack the fundamental skeleton of the Communications Act itself, eroding the framework around which the Act’s regulations are built.¹⁰

Or as we have noted elsewhere:

There is, quite simply, no economic basis for extending a regulatory system intended to open markets to competition through regulated access mandates to copper networks that were built by the Ma Bell monopoly to cover infrastructure investments by ILECs in new fiber networks made long after the AT&T breakup. Expropriation by forced access deters investment, and is not needed to maintain competition

⁹ Yoo, *supra* note 7, at 9, 11.

¹⁰ John T. Nakahata, *Broadband Regulation at the Demise of the 1934 Act: The Challenge of Muddling Through*, 12 COMM-LAW CONSPICUOUS 169, 169 (2004), available at <http://scholarship.law.edu/commlaw/vol12/iss2/7/>.

in today's telecommunications market.... [S]o long as the principles of unbundling and forced access remain enshrined in law, network owners will not be able to reap the full fruits of their investment. Instead, investment will be curtailed as risk-adjusted expected returns will always be diminished by the possibility of future, more significant expansions of the scope and extent of regulation. In the end it is consumers who will suffer for these reduced investment incentives.

It is difficult to see what could possibly justify further delay in recognizing that unbundled access and interconnection mandates for IP networks lack economic and legal justification. The FCC would do well to recognize that today's wireline providers are no longer the "dominant" heirs to Ma Bell they once were — and thus end such mandates once and for all.¹¹

And as Commissioner Pai has similarly observed:

[O]ur rules continue to presume static domination by monopoly providers. We need a forward-looking regulatory framework that will expedite the Internet Protocol (IP) transition and accommodate — indeed, encourage — the most important technological revolution of our time....[T]he Task Force should resist the urge to simply import the rules of the old world into the new.¹²

An Alternative Competition Framework for the FCC

There is, however, a fairly simple (philosophically, at least) solution: Adopt effects-based competition principles from antitrust to adjudicate disputes arising within the purview of the FCC, and reject the formalistic presumptions and resulting regulatory apparatus of the Communications Act. Such a framework is the best way, perhaps the only way, for Congress to give the FCC both the flexibility needed to keep up with technological change and the analytical rigor needed to ensure that the FCC's

¹¹ Starr, et al., IP Transition Comments, *supra* note 6, at 7-8.

¹² Ajit Pai, Statement of Commissioner Ajit Pai On the Formation of a Technology Transitions Policy Task Force (Dec. 10, 2012), *available at* <http://www.fcc.gov/document/pai-statement-formation-technology-transitions-policy-task-force>.

interventions actually do more to help consumers than to harm them.

In 2005, a diverse group of academics and tech policy experts – Democrats and Republicans, moderates, progressives, New Democrats, conservatives and libertarians – forged a consensus for how to rewrite the Communications Act. This working group recognized that “competition law and economics provides the only sound basis for governing communications markets in the future, as those markets become more competitive.”¹³ At its heart, the consensus behind the Digital Age Communications Act¹⁴ rested on essentially the same principle as Kennard’s vision: “In short, we will be guided by one principle: the elimination of rules that impede competition and innovation and do not promote consumer welfare.”¹⁵ In other words, Kennard argued that the FCC should focus on effects rather than formalism. Thus, the DACA model did away with “the persistent technological silos . . . [and instead opted] for the antitrust-derived standard of consumer welfare and embrace[d] competitive markets as the first protection of that welfare.”¹⁶ Even current FCC Chairman Tom Wheeler recently embraced the same (rhetorical) approach, declaring that “the mantra today at the FCC is ‘Competition, Competition, Competition.’”¹⁷

Such an approach stands in stark contrast to the 1996 Act:

The 1996 Telecommunications Act is not deregulation but a vast new regulatory program designed to mold and shape competition through mandatory wholesale leasing of pieces of an incredibly complicated network at prices that are based on regulators' imperfect understand-

¹³ See RANDOLPH J. MAY & JAMES B. SPETA, DIGITAL AGE COMMUNICATIONS ACT: PROPOSAL OF THE REGULATORY FRAMEWORK WORKING GROUP, RELEASE 1.0, 18 (Washington, DC: Progress and Freedom Foundation, June 2005), available at <http://www.pff.org/issues-pubs/other/050617regframework.pdf>.

¹⁴ See generally JOHN F. DUFFY, ET AL., DIGITAL AGE COMMUNICATIONS ACT: REPORT FROM THE WORKING GROUP ON INSTITUTIONAL REFORM (Nov. 2006), available at http://www.freestatefoundation.org/images/Final_Published_DACA_Report.pdf.

¹⁵ Kennard Strategic Plan, *supra* note 4, at IV-B.

¹⁶ Raymond L. Gifford, *The Continuing Case for Serious Communications Law Reform* 5 (Mercatus Ctr. Working Paper No. 11-44, 2011), available at http://mercatus.org/sites/default/files/publication/Gifford_Communications_Law_Reform.pdf.

¹⁷ FCC, Remarks of Chairman Tom Wheeler at the National Cable & Telecommunications Association 4-5 (Apr. 30, 2014), available at <http://www.fcc.gov/document/chairman-tom-wheeler-remarks-ncta>.

ing of costs.¹⁸

Whereas the 1996 Act, particularly in Title II, adopts formalistic presumptions and imposes specific regulatory outcomes, even in the face of ever-increasing uncertainty and technological change, an effects-based approach would generally employ *ex post* analysis of conduct and a broad assessment of its economic consequences to determine the propriety of various actions. Instead of foreclosing or mandating specific conduct, it allows innovation, technological development and changes in consumer preferences to guide conduct, intervening only where actual competitive harms develop (or, in a few cases, are substantially likely to develop in the future).

Of course, we acknowledge that the FCC's public interest standard is broader than the consumer protection standard utilized by the FTC and that, as a political matter, Congress is likely to insist that the FCC continue to factor non-economic concerns into its decision-making processes. Thus, even after a rewrite, the FCC might still be required to support some programs or regulations even if they have negative or minimal impact on competition. For example, MVPDs might be required to carry Public, Educational, and Governmental (PEG) programming (under the must-carry regime) to advance free speech rights or increase the vibrancy of the marketplace for ideas, even though a truly competitive market would result in these channels being replaced by more consumer-oriented and advertising-supported programming.

Such interventions should be the exceptions to the general rule that the FCC should be focused on advancing consumer welfare by rigorously assessing costs and benefits, including the error costs of over-regulating, which is both more likely and harder to correct than under-regulating.¹⁹ Moreover, the FCC should be required to approach even these non-economic concerns through an effects-based lens, weighing the tradeoffs and error costs as rigorously as possible.

¹⁸ Robert Crandall, *The Telecom Act's Phone-y Deregulation*, WALL ST. J. (Jan. 27, 1999), available at <http://www.brookings.edu/research/opinions/1999/01/27business-crandall>.

¹⁹ See Geoffrey A. Manne & Joshua D. Wright, *Innovation and the Limits of Antitrust*, 6 J. COMP. L. & ECON. 153, 158-63 (2010) (noting that Type I errors condemning pro-competitive practices generally have higher costs than Type II errors allowing anti-competitive practices because the market tends to ameliorate the harms from Type II errors).

FCC Competition Policy's Net Neutrality Problem

In the last nine years since DACA, the need for a new Act has grown more acute. Yet, unfortunately, telecommunications policy has been bitterly polarized, most notably by the uniquely divisive and radicalizing issue of Net Neutrality.

Net Neutrality is, in some ways, borne out of the same realization that animates our comments here: The rise of broadband and the delivery of "Everything over IP" have so disrupted the existing regulatory regime that competition concerns can no longer be adequately addressed by the existing regulations. But where Net Neutrality falters is in its embrace of both the vertical structural assumptions of the Act, as well as its affinity for the Act's outdated, *ex ante*, prescriptive approach. Moreover, Net Neutrality is itself inherently non-neutral, in that it begins with the assumption (discussed above and enshrined in the Act) that innovation and competition in complementary markets should always trump network innovation and competition. As a result, instead of arguing for an *ex post* assessment of competitive effects arising out of the uncertain and always-evolving relationship between broadband networks and edge providers, Net Neutrality advocates essentially adopt the apparatus of Title II as their competition policy lodestar.

The FCC has twice tried to regulate Net Neutrality, first by claiming vague ancillary authority to enforce the FCC's 2005 Open Internet policy statement,²⁰ then by claiming only slightly less vague ancillary authority to enforce its 2010 Open Internet Order.²¹ Now, the FCC has proposed two alternative bases for jurisdiction, Title II (with forbearance) and Section 706. Both are efforts to overcome the formalism of the 1996 Act in order to invent, out of whole cloth, a new regulatory regime for the most important aspect of modern telecommunications competition policy: the intersection between broadband and applications. Both demonstrate the extreme dis-

²⁰ See FCC, Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Policy Statement, FCC 05-151 (2005), available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-05-151A1.pdf; see also *Comcast Corp. v. F.C.C.*, 526 F.3d 763 (D.C. Cir. 2008) (rejecting the FCC's asserted authority to enforce the Open Internet Policy Statement).

²¹ See FCC, Preserving the Open Internet, Final Rule, FCC 10-201, 76 Fed. Reg. 59,192 (Sept. 23, 2011), available at <http://www.gpo.gov/fdsys/pkg/FR-2011-09-23/pdf/2011-24259.pdf>; see also *Verizon v. F.C.C.*, 740 F.3d 623 (D.C. Cir. 2014).

connect of allowing the FCC to continue applying the 1996 Telecommunications Act to a world of broadband-driven convergence and the need for Congress to start over with an effects-based approach.

On the one hand, the FCC proposes to place broadband into the regulatory silo of Title II, the set of public utility regulations designed for the monopoly telephone network — the very model of regulation that the Clinton Administration’s FCC tried to move away from in its prescient effort to promote the massive capital expenditures needed to build the infrastructure behind today’s Internet. Although there are superficial similarities between Title II’s formalistic approach to fostering competition through unbundling (a form of open access) and the sort of non-discrimination sought by Net Neutrality proponents, the competitive and regulatory dynamics are so different that today’s push for regulation borders on the absurd. In fact, those now advocating for reclassification essentially claim that the Title II silo fits Net Neutrality... but that it can and should simultaneously be leveled somewhat (through the forbearance process), to suit their needs.²²

Both claims are false: Title II is not a viable basis for modern competition policy, even from the perspective of those who advocate for Net Neutrality regulation. Far from banning prioritization (as Net Neutrality proponents so adamantly insist must be done) Title II simply requires that prioritization be “just and reasonable.”²³ While Title II will not get them what they most want, it *would* trigger, by default, a host of other regulations that are, as we have noted, wholly inappropriate for the current

²² This reclassification-with-forbearance approach was proposed in 2010 by Chairman Genachowski. In defense of the proposal, Genachowski’s General Counsel, Austin Schlick, asserted that: “The Commission is able to tailor the requirements of Title II so that they conform precisely to the policy consensus for broadband transmission services. Specifically, the Commission could implement the consensus policy approach—and maintain substantively the same legal framework as under Title I—by forbearing from applying the vast majority of Title II’s 48 provisions to broadband access services, making the classification change effective upon the completion of forbearance, and enforcing a small handful of remaining statutory requirements.” Austin Schlick, *Legal Framework: A Third Way Legal Framework for Addressing the Comcast Dilemma* (May 6, 2010), available at <http://www.broadband.gov/third-way-legal-framework-for-addressing-the-comcast-dilemma.html>.

²³ 47 U.S.C. § 202(a) (2012).

environment.²⁴

While the Act gives the FCC vast discretion under the standard (or non-standard standard²⁵) of the “public interest,” Section 10 of the Communications Act requires much more than this: affirmative findings about the state of competition, market by market.²⁶ But if the Commission could reverse course, and make forbearance as easy as proponents assert, then so too, by implication, would “un-forbearance” be just as readily available. That would mean that once a service was placed within Title II, it would *always* be potentially subject to the requirements of Title II, depending on the whims of the FCC. Such regime uncertainty, hinging ironically on the certainty of binary classification decisions under the Act, is merely another manifestation of the Act’s formalism. As such it would perpetuate the outdated structure of the Act and undermine investment in competing infrastructure – precisely the opposite of the pro-deployment agenda begun by the Clinton administration.²⁷

²⁴ At the same time, there is no easy way for the FCC to whittle Title II down to just the three Net Neutrality rules the FCC has tried to impose. Forbearance is simply not this easy, as we shall explain in our forthcoming comments on the FCC’s Notice of Proposed Rulemaking (FCC, Protecting and Promoting the Open Internet, Notice of Proposed Rulemaking, FCC 14-61 (May 15, 2014), available at <http://www.fcc.gov/document/protecting-and-promoting-open-internet-nprm>).

²⁵ See Adam Thierer, *Is the Public Served by the Public Interest Standard?*, THE FREEMAN (Sept. 1, 1996), available at http://www.fee.org/the_freeman/detail/is-the-public-served-by-the-public-interest-standard.

²⁶ See 47 U.S.C. § 160 (2012). Indeed, if the FCC were to accept the dreary claims about the state of the market made by those now advocating Title II, it is difficult to see how the Commission could justify forbearing from the most important aspects of Title II. In fact, the FCC has made forbearance progressively more difficult over the years. See FCC, Petition to Establish Procedural Requirements to Govern Proceedings for Forbearance Under Section 10 of the Communications Act of 1934, Report and Order, FCC 09-56 (2009), available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-09-56A1.pdf. See also *Qwest Corp. v. F.C.C.*, 689 F.3d 1214 (10th Cir. 2012) (rejecting appellant’s contention that wireless voice services compete with appellant’s wireline voice services, and then upholding the FCC’s denial of appellant’s forbearance petition because there were only two participants in the market—as defined—and duopolies provide too much threat of tacit price coordination to constitute effective competition).

²⁷ “How the FCC handles these issues, along with the ability of the Commission and state regulators to implement the interconnection mandate of the 1996 Act, will determine the speed at which the telephone, cable, and Internet-based networks converge into an open data network. The force of technology means that the inevitability of this convergence is not really in question, but the pace of convergence still rests with federal and state regulators.” Podesta, *supra* note 2, at 1114.

On the other hand, given the impracticality of Title II, and its harmful real-world consequences for broadband as well as edge providers, the FCC seems almost certain to issue new Net Neutrality rules under Section 706, which the FCC re-interpreted in 2010 as an independent grant of authority. The D.C. Circuit upheld this re-interpretation under *Chevron* in its *Verizon* decision, but required that any regulations under Section 706 leave room for “commercially reasonable” negotiation, lest they amount to *de facto* reclassification of broadband as a common carrier subject to Title II.²⁸

This limiting principle might actually be a sensible approach to competition regulation at the FCC, and one Congress should consider including in the analytical framework behind a new Communications Act. But that does not mean that Congress should stand idly by while the FCC turns Section 706 into the basis for a new approach to competition policy beyond the rigid confines of the 1996 Act. If anything, Section 706 evinces Congress’s intent to promote competition and deployment. Allowing it to become instead the *de facto* Telecommunications Act of 2014, however much we need a new Communications Act, would be an affront to the principle that the American people’s elected representatives, not unelected bureaucrats, should determine how telecommunications should be governed.²⁹

²⁸ See *Verizon*, 740 F.3d at 649-59.

²⁹ It is absurd to argue, as the D.C. Circuit did, that Congress intended Section 706 as a secret grant of power that could moot the rest of the Act simply because the sole piece of legislative history on this Section, the Senate Commerce Committee’s report, described this section as a “failsafe.” *Verizon v. F.C.C.*, 740 F.3d 623, 639 (D.C. Cir. 2014). Congress could have written such a grant of power in clear, explicit terms – and indeed, the Senate did precisely that in what would have been the subsequent section of the Act, only to have that section removed in conference with the House. Compare S. 652 ES, 104th Cong., Sec. 304 & 305 (June 15, 1995) (Engrossed in Senate), with S.652 EAH, 104th Cong. (Oct. 12, 1995) (Engrossed Amendment House) and S.652, 104th Cong. (Jan. 1, 1996) (Enrolled Bill), available at <http://beta.congress.gov/bill/104th-congress/senate-bill/652/text>; see also S. Rep. No. 104-23, at 51 (1995), available at <http://beta.congress.gov/104/crpt/srpt23/CRPT-104srpt23.pdf>. Rather than an independent grant of authority, Section 706 is a mandate to use other grants of authority in the Act for a particular purpose: promoting broadband deployment and competition, just as the FCC concluded in 1998. See FCC, Deployment of Wireline Servs. Offering Advanced Telecom. Capability, CC Docket No. 98-147, Memorandum Opinion and Order, FCC 98-188, at 77 (Aug. 7, 1998) (“[I]n light of the statutory language, the framework of the 1996 Act, its legislative history, and Congress’ policy objectives, the most logical statutory interpretation is that section

Moreover, the FCC's interpretation of Section 706 could allow it not merely to craft a new competition policy for broadband, but to craft a new regulatory regime for competition, consumer protection, copyright, privacy, cybersecurity and so on across the entire field of "communications."³⁰ Thus, Section 706 could be used to regulate the very edge providers that those who advocate for prescriptive Net Neutrality regulations purport to be trying to keep "free." Most troublingly, Section 706, if it is an independent grant of authority, seems to allow the FCC to regulate informally, without the safeguards of formal rulemaking or the opportunity for judicial review that they offer. And Section 706(a) empowers not only the FCC, but also state regulatory commissions. Whatever the FCC's authority over edge providers, if any, it ought to be should be determined by Congress, not the FCC – and within an overall structure that reflects Congress' considered view of the changing and changed competitive conditions.

The FCC's Ongoing Informal Rewrite of the Communications Act

There is also reason to believe that leaving competition policy to the FCC's discretion under the current Act may yield problematic results. In several areas where it has purported to enforce competition principles directly — merger reviews, program access rules, etc. — the FCC has proved itself to be a less than reliable anti-trust enforcer, as a substantive matter.³¹ But perhaps even more disconcerting, the agency has used its transaction review authority to impose merger conditions that bear little or no relationship to competitive issues raised by transactions. In fact, arguably the FCC has itself found some of the formalism of the 1996 Act overly constraining and effectively undertaken to rewrite the substance of the Act through ap-

706 does not constitute an independent grant of authority."), available at http://transition.fcc.gov/Bureaus/Common_Carrier/Orders/1998/fcc98188.pdf [hereinafter "Advanced Services Order"].

³⁰ Subject only to two limits made clear by the D.C. Circuit's decision: (a) the FCC may not violate some specific provision of the act (such as the forbearance requirements of Section 10 or the prohibition on imposing common carriage requirements on an information service) and (b) the FCC must at least assert that its regulations will promote broadband deployment, investment, or competition.

³¹ We discuss the substantive defects in the FCC's merger review process in great detail in Geoffrey Manne, et al., *The Law and Economics of the FCC's Transaction Review Process* (TPRC 41: The 41st Research Conference on Communication, Information and Internet Policy, Aug. 23, 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2242681.

plication of merger conditions. Thus, for example, the FCC uses its leverage over the spectrum review process to require companies to commit to “voluntary” conditions that have allowed the agency to regulate nearly every aspect of industry conduct, without any real legal oversight and without Congressional mandate.³² And in several ways the FCC’s transaction review practices take it outside the rule of law.³³

In effect, the agency uses transaction reviews to impose the kinds of regulations that would otherwise require a formal rulemaking — or that the FCC could not legally impose because of limitations of the Act or even, most troublingly, constitutional constraints.³⁴ In addition to side-stepping notice-and-comment requirements, this regulation-by-merger-condition creates a crazy quilt where different rules apply to different companies, sometimes in different markets.³⁵ This creates a patchwork of rules and obligations, coerced without sound economic justification, in a fashion largely unreviewable by courts, and in contravention of limits placed on the FCC’s authority by Congress and the courts.³⁶

This approach to competition policy in the merger context at the FCC promotes neither sound competition policy principles nor even the competition policies underlying the Act. Unlike the FTC and DOJ, which have the burden of showing a potential merger will be anti-competitive, the FCC can place the burden on the merging parties to prove the benefits of a merger.³⁷ And while the competition authorities must review mergers under the consumer welfare standard delineated under antitrust law, the FCC has a much broader public interest standard of review that allows it to engage in analysis untethered to well-accepted antitrust law and economics.³⁸ Accordingly, the FCC uses its spectrum screen to implement essentially an

³² *Id.* at 10.

³³ *See generally id.*

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.* at 21.

³⁷ *Id.* at 4-5.

³⁸ *Id.* at 4 (“As the D.C. Circuit once stated, the FCC’s job is to ‘make findings related to the pertinent antitrust policies, draw conclusions from the findings, and weigh these conclusions along with other important public interest considerations.’”) (*quoting* *United States v. FCC*, 652 F.2d 72, 82 (D.C. Cir. 1980)).

outdated and discredited structural presumption model of antitrust.³⁹ And as mentioned above, the FCC can and does use its broad authority and ability to hold up transactions to leverage companies into conditions having little or nothing to do with promoting sound competition policy and consumer welfare—in stark contrast to earlier understandings of the aims of the Communications Act.⁴⁰

In short, a rewrite of the 1996 Act is already occurring — except it is being done by the FCC, informally, with no clear limits on its discretion, and with little analytical rigor.

In the end, however, and regardless of whether the FCC has the legal authority to effectively “rewrite” the 1996 Act to fit today’s messy reality into the Act’s neat boxes, doing so is plainly unwise. As we have noted elsewhere:

Title II regulations are hard-coded for both the technology and the artificial competitive environment of a dying TDM universe. They should not, and legally may not, be applied “as is” to IP networks. Nor can they simply be “adapted” to a new and more dynamic ecosystem.

While market forces may not always ensure the perfect alignment of industry conduct with the best interests of consumers, it does not follow that any particular regulatory solution—least of all regulation intended for entirely different circumstances—is preferable. In the face of significant non-government constraints, the case for blunt, prophylactic regulations like interconnection mandates to protect against future problems that may never arise is extremely weak.

Marketplace and reputational incentives drive interconnection and consumer protections in the market, and networks have little incentive to harm their own customers. These forces are bolstered by various multistakeholder processes that continue to evolve to regulate industry practices and to supplement direct company-to-company dispute

³⁹ See *id.* at 23-29.

⁴⁰ Kennard Strategic Plan, *supra* note 4, at IV-B.

resolution. At the same time, the FCC retains authority under Title I of the Communications Act to regulate for public safety, and antitrust and consumer protection laws govern IP services precisely because they are not regulated as common carriers (which are excluded from the FTC's otherwise general jurisdiction over the economy).⁴¹

The questions asked by the Committee regarding the proper definition and application of competition policy in the modern communications marketplace imply to some extent that there might be a distinction between the appropriate competition principles applied under the antitrust laws and those applied in the communications context and/or by the FCC. While there is certainly a substantial literature on the particular economics of network competition and communications networks, the basic principles of competition policy are well-established and directly applicable here. To some extent the same is true of process principles, as well: we have a pretty good idea how to apply competition policy.

As mentioned above, Congress should consider the DACA model to guide the FCC. Such a model would "be based on technology- and provider-neutral regulatory criteria[,] . . . premised on legal principles drawn largely from competition law[, and] the regulatory structure ought to pursue non-economic regulatory goals with as light a touch as possible[.]"⁴² These were the three "incontestable" principles the DACA working group was able to settle on in 2005, and they still hold true today.⁴³

As the current Congress once again considers these issues, they inevitably must come to the same conclusion: "[T]he antitrust model most appropriately captures the development of competition in telecommunications markets[.]" and "provides the best response to problems of sector-specific regulation."⁴⁴ This does not mean that a "pure" antitrust model must be adopted, and the FCC may be maintained as a "sector-specific regulator." But such a proposal should import "the general 'unfair competition standard' from the FTC Act as the principal substantive standard for

⁴¹ Manne, et al., IP Transition Reply Comments, *supra* note 6, at 10.

⁴² May & Speta, *supra* note 13, at 10.

⁴³ See *id.*

⁴⁴ *Id.* at 11.

FCC action."⁴⁵ Further specifics can be hammered out along the way, but competition law should be the lodestar to guide Congress in crafting an effects-based regulatory regime to govern the modern American communications marketplace.

Conclusion

Twenty years ago, Democrats and Republicans agreed on the need to refocus communications competition policy on promoting competition in an era of convergence, focusing on effects rather than formalism. Unfortunately, that focus was lost in the sausage-making process of legislation – and the FCC has been increasingly adrift ever since. The FCC has not waited for Congress to act, and has instead found creative ways to sidestep the formalist structure of the Act. It is high time for Congress to reassert its authority and to craft a new act focused on the effects of competition as a durable basis for regulation.

The antitrust statutes have not been fundamentally modified in over a century because Congress has not needed to do so: antitrust law has evolved on top of them through a mix of court decisions and doctrinal development articulated by the anti-trust agencies. At the heart of this evolution of common law has been one guiding concern: effects on consumer welfare, seen through the lens of law and economics. The same concern and same analytical lens should guide the re-write of the Communications Act that is, by now, two decades overdue.

While refocusing competition regulation on effects, Congress should give equal focus to minimizing remaining barriers to competition. In particular, that means minimizing regulatory uncertainty (and, in particular, avoiding any return to mostly archaic Title II regulations); maximizing the amount of spectrum available; simplifying the construction and upgrading of wireless towers to maximize the capacity of wireless broadband; and promoting infrastructure policy at all levels of government that makes deployment cost-effective.⁴⁶ As Blair Levin recently observed:

As we saw with the data from the National Broadband Plan, these

⁴⁵ See *id.* at 18-19.

⁴⁶ Examples include initiatives to facilitate use of open conduits (or “Dig Once” initiatives) and non-discriminatory pricing regimes for pole attachments covering all broadband providers equally.

networks are staggeringly expensive. Breaking free from the status quo requires both creative and viable economic models. After all, the broadband operators are businesses, not charities. If Communities do not work to lower barriers to entry and enable efficient builds, the necessary new investment simply will not happen.⁴⁷

There is still a consensus that can be reached on these issues, and much can be done to move the ball forward when it comes to promoting broadband deployment in America. We applaud the Committee, once again, for taking up this task, and we look forward to engaging more on these issues as the Committee proceeds.

⁴⁷ Blair Levin, *Holding Back High-Speed Internet for the Poor's Sake Just Hurts Everyone*, Wired (June 12, 2014), available at <http://www.wired.com/2014/06/holding-back-high-speed-internet-for-the-poor-sake-just-hurts-everyone/>.

Dear Representatives on the House Energy and Commerce Committee,

Healthcare is generally a divisive issue in Congress, however, by integrating more technology-based solutions we can reduce the cost and controversy of this issue. Broadband is an enabling technology for many of these healthcare advancements. My company Telepharm, based in Iowa City, harnesses the power of broadband to make remote pharmacies available in rural areas. However, my company would not be possible without the robust broadband competition we have seen across the country. Today consumers have access to many different broadband connections at home through cable, telephone and satellite, and on the go through wireless networks and wi-fi hot spots. In the U.S., 82% of the population has a choice of four or more wireless providers and 97% live in census areas with two or more fixed broadband services.

As your Committee debates modernizing the Telecommunications Act of 1996, I hope you consider the implications for innovation in different industries like mine. I am including an op-ed I wrote for the [Des-Moines Register](#) that you might find helpful throughout this important process.

Regards,

Roby Miller

Founder of Telepharm

Iowa View: Broadband plan will be a boon for Iowa's economy

[*March 9, 2014*](#)

As I gear up for this year's SXSW Festival, I am in awe of the technological advancements our nation has made in the last several decades. But it's not just me taking notice of how integral technology is to our daily lives.

At the outset of the legislative session, Gov. Branstad proposed an idea with the potential to transform Iowa's economy: the "Connect Every Iowan Act" that would encourage the expansion of broadband in the state.

State leaders should put this plan into action to get us on a path to creating our own Silicon Valley right here in Iowa.

Broadband is jump-starting tech hubs all over the country — including, recently, in Midwestern cities such as Des Moines, Omaha, Iowa City and St. Louis — by inspiring businesses such as Performance Marketing or Dwolla to harness the power of high-speed Internet to connect people in new and innovative ways.

Gov. Branstad's proposal would expand and fortify Iowa's broadband network by offering property tax exemptions for companies that bolster network capacity in areas with limited high-speed Internet service — an undeniable problem in the rural areas of our state. The plan also includes more career training in communications and technology to prepare workers for the 21st century economy.

These ideas can pave the way for a dramatic expansion of Iowa's tech industry, creating jobs and boosting our economy in the process.

Fast, accessible broadband promotes new businesses by enabling innovative new products and services to make consumers' lives easier. It also promotes growth by allowing businesses to operate more efficiently, with more employees able to work remotely and video-conference tools eliminating the need for larger and more expensive offices.

My company, TelePharm, is completely dependent on broadband accessibility. TelePharm enables pharmacists to reach rural areas of the nation (in Iowa, among other states) where it may not be economically feasible to employ a full-time pharmacist. Our software allows for a virtual pharmacist presence, keeping costs down for rural pharmacies and in turn, keeping doors open.

Just 10 years ago, a company like TelePharm would not have existed. But in the past decade, we have seen a massive proliferation of high-speed Internet that has broadened opportunities for aspiring entrepreneurs. Today, thanks to these advancements, my company is creating jobs helping to connect folks around the country.

Yet, we cannot rest on our laurels. While broadband availability has dramatically increased in recent years, many corners of the country still lack high-speed Internet.

Iowa is no exception. In our state, 25 percent of urban and suburban residents have not adopted broadband, along with 29 percent of small businesses in the same areas. The problem is even more acute in rural areas, where 34 percent of residents have yet to adopt broadband.

In these rural communities, broadband can close distances, allowing residents in far-flung areas to easily keep in touch with each other, whether to catch up with friends or contact a family member in case of an emergency.

To spur even more broadband-powered innovation, we need to get all Iowans online — and Gov. Branstad's plan is a great step toward this goal.

There is also more that must be done beyond Iowa's borders. Federal regulations should be tailored to a fast-growing and sometimes unpredictable tech industry. Right now, these rules are facing a watershed moment as the U.S. House Energy and Commerce Committee prepares to revise the Communications Act for the first time in 18 years. Today's communications landscape is virtually unrecognizable from that of 1996, when the Internet was only starting to become popular.

Back then, there was a clear line drawn between telephone and cable service — the Internet was still in its infancy. But today's communications services are dynamic and overlapping, with telephone, cable, satellite, fiber optics and wireless all able to transmit voice, video and data over the Internet.

Yet, the law still reflects yesterday's reality, slowing innovation in the Internet space. Congress can update the law by making it technology neutral and regulating all broadband services equally.

We have a golden opportunity to make Iowa a thriving tech center in the years ahead. To get there, we need to expand our broadband network to ensure that all Iowans are connected while adopting smart regulations going forward. Let's start right here at home — by making Gov. Branstad's ideas for broadband in Iowa a reality.



Telecommunication Industry Association Comments regarding House Energy & Commerce Committee's Competition White Paper

- 1. How should Congress define competition in the modern communications marketplace? How can we ensure that this definition is flexible enough to accommodate this rapidly changing industry?*

Telecommunications policy should replace the current “regulatory silos” that are based on legacy services to reflect a broadband marketplace of competing services and technologies. A legislative focus on specific, well-defined public interest objectives will ultimately prove more durable in achieving those objectives as technology evolves, rather than an approach which micro-manages how content providers, network operators, and customers should relate to each other.

- 2. What principles should form the basis of competition policy in the oversight of the modern communications ecosystem?*

A modern Communications Act should be renewed to focus around the unifying purpose of achieving universal, reliable, and affordable access to broadband without undue subsidization. In doing so, Congress should recognize the successes that a light-touch regulatory model has had in enabling advanced value-added services.

As a matter of basic technology, that once-useful distinction between circuit / message switching and data processing is no longer relevant in a broadband world in which all communications traffic is delivered via Internet Protocol. As a result, services going forward will more closely resemble

“information services” than “telecommunications services,” at least as those terms were envisioned in 1996, and regulation should be consistent with this change.

- 3. How should intermodal competition factor into an analysis of competition in the communications market?*

Multiple technologies and their associated business platforms directly challenge each other in the marketplace in a manner not fully contemplated at the time of the 1996 Act. In addition, over-the-top services compete against stand-alone services, and service providers offer “triple-play” and “quad-play” packages. Policies should be updated to reflect this reality.

- 4. Some have suggested that the FCC be transitioned to an enforcement agency, along the lines of the operation of the Federal Trade Commission, rather than use broad rulemaking authority to set rules a priori. What role should the FCC play in competition policy?*

Beyond assuring a competitive marketplace, the FCC has an important public interest role to play in ensuring that all Americans have access to broadband. Indeed, Congress should articulate and consolidate – perhaps in one title or section of the Act – all of the *specific* public interest objectives it seeks to achieve.

These could include, for example:

- Universal high speed broadband access to homes, businesses, public safety, libraries, and schools without undue subsidization;
- Availability of broadband services in public spaces such as roadways or parks, and for public purposes;
- Reliable emergency communications for services such as 9-1-1, and for public safety responders, the realization of the full potential of an interoperable nationwide public safety broadband network;
- Reasonable telecommunications accessibility for those with disabilities.

5. *What, if any, are the implications of ongoing intermodal competition at the service level on the Commission's authority? Should the scope of the Commission's jurisdiction be changed as a result?*

The market for broadband is highly competitive, with most consumers having access to various modes of broadband service delivery.

Going forward, a unified light-touch model for regulation should be focused on ensuring universal, reliable, and affordable access to broadband – both by people and by devices themselves – while ensuring that advanced value-added services can continue to facilitate innovation as they have done under the current light-touch model.

6. *What, if any, are the implications of ongoing intermodal competition on the role of the FCC in spectrum policy?*

Congress should improve spectrum management broadly, including both government and private uses of spectrum. To begin with, Congress should clarify the jurisdiction of various agencies, including both the FCC and NTIA, regarding management of the entire electromagnetic spectrum. Large portions of spectrum are currently used for federal government or other public purposes, and better management of all the nation's spectrum resources is needed to meet ever-increasing demand today and in the future "Internet of Things," using a range of technologies and services.

As things stand, even conducting a spectrum inventory remains a challenging task. A forward-looking Communications Act that is simpler, more transparent, and clarifies agency roles would greatly facilitate more efficient spectrum use. Congress should also allocate a small fraction of future spectrum auction revenues towards better spectrum management and towards (currently underfunded) telecommunications R&D efforts on topics like spectrum sharing

The laws of physics dictate that spectrum is a limited resource, so government will continue to play an important role in avoiding the "tragedy of the commons" problem, whereby spectrum becomes unusable. Today's service-specific and balkanized regulations governing spectrum allocations need to be reexamined in response to the convergence around broadband. Moreover, the Act should look to the future by accommodating various assignment approaches including traditional licensing, unlicensed uses, or emerging hybrid models based on technological advances in spectrum sharing.

A national spectrum policy must reflect the following principles to allow the nation's use of radio spectrum to evolve to meet changing demand and innovation:

- Spectrum allocations need to be predictable – identifying demand and changes in demand, understanding the pace of radio technology development by platform, and planning for the long term are all part of a spectrum policy plan that can support predictability for both commercial and government users.
- For commercial allocations, flexible use policies consistent with baseline technical rules that are technology-neutral have generally proven to be the best policy.
- Government allocations of spectrum should be better managed to ensure better usage of scarce spectrum resources for all users.
- Policies should encourage more efficient use of spectrum where technically and economically feasible.
- In cases where band sharing is technically and economically possible, policies must advance good engineering practice to best support an environment that protects those with superior spectrum rights from harmful interference.

7. *What, if any, are the implications of ongoing intermodal competition at the service level on the FCC's role in mergers analysis and approval?*

The definitions of markets should reflect the increasing competitiveness of telecommunications markets across services and technologies. Such a holistic market analysis will also permit a reevaluation of the extent to which legacy regulation is still required, particularly where that regulation is imposed on only some of the competitors.

8. *Competition at the network level has been a focus of FCC regulation in the past. As networks are increasingly substitutes for one another, competition between services has become even more important. Following the Verizon decision, the reach of the Commission to regulate "edge providers" on the Internet is the subject of some disagreement. How should we define competition among edge providers? What role, if any, should the Commission have to regulate edge providers – providers of services that are network agnostic?*

The legacy regulatory distinction regarding "edge providers," between information and telecommunications services – or "basic" and "enhanced" services, succeeded in allowing new value-added services that required telecommunications transport to be introduced free from the encumbrances of regulation or legacy carrier market power. Indeed, its success facilitated the rapid adoption of the Internet in the U.S. TIA cautions against bringing "edge services" under the ambit of telecommunications regulation.

Were this important distinction not continued, to the extent that "edge providers" benefit from universal broadband service, it could be argued that they should also contribute to the subsidization programs that will spur and support universal broadband service.¹

¹ Of historic note, "enhanced service providers" (the previous term for information service providers) were originally exempted from the payment of access charges by the FCC on what was supposed to be a "temporary" basis in order to protect that "nascent industry."

9. *What regulatory construct would best address the changing face of competition in the modern communications ecosystem and remain flexible to address future change?*

The FCC's regulatory authority should be connected directly to achieving the specific end-user objectives set forth by Congress. Intermediary regulations – whether imposed by the agency or by statute – should be eliminated. For example, the current Act's mandates regarding provider-to-provider issues such as interconnection need to be re-evaluated in the context of the IP transition, since the nature of technology means that such regulations may always lag behind business models and changes in consumer demand.

Instead, the FCC's role should be to regulate with a light touch, much as it presently does in the information services space. It should intervene only in cases where demonstrable evidence shows a disruption to the ecosystem in which industry can continue to innovate, consumers are protected, and Congress' specific user-facing objectives are achieved. Indeed, the initial response to the D.C. Circuit's recent decision from Internet service providers was to express their continued commitment to maintaining an open Internet, which is not surprising since the current dynamic ecosystem serves the long-term economic interest of all concerned. Market forces should be allowed to operate more smoothly in responding to changes in content delivery models, including the establishment of more transparent and efficient secondary markets.

Although forward-looking legislation will always be difficult in such a rapidly-evolving marketplace, there may be specific things Congress can do to (literally) pave the way to the future. For example, "dig-once" legislation would require empty conduits for telecommunications to be incorporated into road construction and other public infrastructure projects. Over time, this simple policy could greatly decrease network deployment costs while facilitating future technologies such as intelligent transportation systems.

10. *Given the rapid change in the competitive market for communications networks and services, should the Communications Act require periodic reauthorization by Congress to provide opportunity to reevaluate the effectiveness of and necessity for its provisions?*

Congress should generally refrain from micro-management of technical issues. The current Communications Act wisely charges the FCC to resolve detailed technical matters, including issues such as radio interference and the interconnection of devices to networks. Continuing with those two specific examples, legislative mandates on receiver standards or the interoperability of devices are not appropriate. Rather, much better solutions would come from simpler and more transparent spectrum management in the first place, or by focusing on whether Congress' specific public interest objectives regarding universal access to new technologies are being achieved, respectively.

Second, with the FCC expected to play an important role even under a future Communications Act, Congress should enhance the quality of the FCC's work through process reform legislation. Indeed, the House Energy and Commerce Committee recently advanced meaningful and bipartisan legislation. Another useful proposal once championed by former Sen. Olympia Snowe would allow each FCC commissioner to hire a technical staff member, likely sharpening the quality of technical discussions and debates within the agency prior to formulation of final rules.

**U.S. Cellular's Response to the
House Energy & Commerce Committee's
White Paper on
Competition Policy and the Role of the Federal Communications Commission**

Since the late 1980's a competitive, innovative wireless industry has been the driver of robust economic growth by increasing American's ability to connect in a timely manner, facilitating business, increasing safety, and provided innumerable sources of entertainment for millions of consumers. All of this investment and innovation in wireless networks and services has been driven by the relentless demands of a competitive market place. Some companies have prevailed and become the household names we know today while others have disappeared after failing to create viable business plans. The one thing they all shared, however, was that they operated under a set of common rules that established how the market was to be governed to ensure robust competition flourished. Those rules provided the certainty necessary to liberate innovation and investment in what was an otherwise nascent and risky sector.

While we no longer carry around cell phones that were the size and weight of a brick that also required us to carry around an additional packs the size of a car battery, we do benefit from the rules established at that time which served as the essential rootkit for competition and innovation. What has happened since the inception of the commercial industry in the late 80's? The number of wireless customers now exceeds 330 million. Many Americans prefer a mobile device over a landline version and are cutting the cord. The proliferation of smartphones could be the world's greatest technological achievement spurring economic growth at an aggressive pace for many decades to come. But will this achievement be fully realized if the wireless industry does not continue to face competitive pressures?

So what ideas were a part of the initial regulatory and business ecosystem that took us from bricks to gigabytes in such a short time? There are many. Most importantly, concepts like interoperability, reasonable access to spectrum, and other consumer-centric expectations for service were critical items that pit companies against one another in the race to win customers. What the advent of mobile communications did not do, however, was arise in a cauldron of laissez-faire practices.

Perhaps the closest analogy to how "competition" and "rules" at that time were interwoven is football. We all accept that a football field is 100 yards long. We agree that each team can only field 11 players at a time. We support the concept of enforcing penalties so that one team does not hold, clip, or begin running around prior to a snap and we entrust the duty to uphold those rules to officials that are trained and supposed to be neutral to the outcome of the game. Allowing one team to field 15 players to another's 11 would not result in a competitive game that anyone would watch. Allowing one team to own another and funnel all the best players to a team would not be accepted. And the idea that the home team could make all the officiating rules would be impossible to accept.

The same elements were present at the beginning of the mobile marketplace and have persisted to this day. We know the scope of the field (what spectrum is in use), we agree that consumers should have the technological ability to move around carriers and pick the devices they want most (interoperability), and the Federal Communications Commission (FCC) has been the official enforcing the rules that the league (in this case, Congress) has dictated. Individual rules can be revisited, modified, and discarded, but they are not shelved in their entirety.

In short, competition and innovation does not flourish in the absence of rules, but is nurtured by ones that are limited yet appropriate in scope. The rules should be informed by a series of principles which should be embedded into the law. These principles will guide market players and not hinder their ability to innovate. While we cannot predict how the marketplace will evolve, we should commit ourselves to a permanent set of guiding principles that encourage competition and continually pressure industries to explore new technologies and services.

U.S. Cellular welcomes the opportunity to discuss what role Congress, the FCC, and the market should play in achieving this goal. Trying to identify what principles should guide the next generation of mobility and mobile services is a timely and important undertaking.

As U.S. Cellular reviews the White Paper, we applaud the fact that the document raises important questions beyond simply how are networks built and financed. We welcome and are challenged by the insightful questions regarding the policy and market impacts of services that now flow atop that architecture, their impacts on bandwidth demand, and also raise the question of whether content creators, providers, and other services now have sufficient market power that they too must be a part of the dialogue.

The first question is the most seminal one raised by the White Paper: “How should Congress define competition in the modern communications marketplace? How can we ensure that this definition is flexible enough to accommodate this rapidly changing industry?” And the second raises the exact point U.S. Cellular thinks should be the guiding North Star for national policy in that we must establish the principles that form the core filter through which oversight of the marketplace should be conducted.

While there is no simple answer to the perfect definition of “competition” at this point, U.S. Cellular believes there are some additional questions that all parties should be asked to address that will help policy makers reach a meaningful definition. Specifically, is competition limited to carrier versus carrier analysis or are there other forums of competition that affect the viability of a company? How many providers of a service must be in a market for it to be deemed “competitive?” 2? 3? More? We believe that a truly vibrant market place does not depend upon satisfying a minimum number.

With regards to the mobile marketplace, Congress and the FCC has spent significant effort to understand and address the shortage of spectrum and how to divvy up that scarce and valuable asset in the most competitive manner possible between carriers. Should spectrum holdings be measured by today’s usage demands? Should holdings be viewed on a band-by-band basis? Should holdings be viewed comprehensively based upon forecasted demands for 10-15 years out? Can any forecast be

useful or reliable? These questions are critical as investment decisions are sensitive to long-term time horizons and any policy that is too limited in scope or time may result in insufficient investment or competition in markets.

Other topics to consider could include how exclusive content deals might impact service providers. Access to popular, non-time shiftable programming such as sporting events, might prove to be just as important in determining what providers are viable in a way that systems that simply provided voice services could not have imagined back in the 80's and 90's.

Another question is whether over-the-top services have any responsibility for the care, upkeep, and upgrading of the networks upon which their product is delivered. As the demands on networks increase, without Internet service providers actually making decisions about what content flows across its networks, where does the responsibility for maintenance and expansion fall: on consumers? On content providers? Both? Neither? The decisions you make regarding how those costs and responsibilities are apportioned will determine whether the networks will continue to see exponential increases in performance or whether innovation and deployment upgrades slow.

Congress also needs to consider that the wireless marketplace has changed dramatically since 1996. At that time, industry was much less consolidated and the opportunity for anticompetitive behavior was less prevalent due to the fact that each of the wireless companies needed one another in order to offer seamless nationwide service. Today that interrelationship is much less prevalent. Congress must assess the impact of this change on the level of regulation that is appropriate.

It is also difficult not to take this opportunity to address one other core principle that US Cellular believes is in need of attention. While the 1996 Act was clear to determine that rural and urban consumers should have access to similar quality services and that such an option would also include wireless services, U.S. Cellular believes the regulatory realm has short changed wireless consumers. For all the advances wireless networks have made in the past 20 years regarding build-out and system upgrades, the fact remains that there are significant geographic areas and populations that lack coverage or quality service. U.S. Cellular fears that there is growing sense of apathy around getting to those last areas and that the Universal Service fund and other policy decisions are abandoning the mission of serving everyone everywhere. U.S. Cellular understands the financial costs of serving remote markets, but believes there are efficient and effective methods for doing so that can be implemented in a manner that relies on competition. A specific focus on this topic is long overdue.

Finally, US Cellular believes that there is significant value in requiring periodic reauthorization of the Communication Act, regardless of the decisions that are made this juncture. While regulatory certainty is important to foster a climate that encourages investment, it is also true that revisiting laws produces a healthy debate and review on what is working and what is not. The duration between reviews is an open question, but is one well worth considering.



June 12, 2014

Chairman Fred Upton and Ranking Member Henry Waxman
U.S. Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515

RE: USHCC Communications Act White Paper Filing

Dear Chairman Upton and Ranking Member Waxman:

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We are writing you today in response to the House Committee on Energy and Commerce's request for comments regarding competition for the upcoming update on the Communications Act. The United States Hispanic Chamber of Commerce (USHCC) advocates on behalf of nearly 3.2 million Hispanic-owned businesses that together contribute in excess of \$468 billion to the American economy each year. We thank you for allowing the USHCC to once again share its perspectives with the Committee.

The wireless internet market, one of the most robust in all of technology, has been an incredible boon for Hispanic consumers and businesses alike. Competition is forcing prices to decrease and services to increase and the community has benefited enormously. Hispanics are 76 percent more likely than their White counterparts to access the internet from a mobile device, and innumerable businesses are dependent on wireless services for their operations' needs on a day-to-day basis. Competition, therefore, has already had tangible, real-world consequences for Hispanics nationwide.

As different technologies converge in the communications marketplace, however, Congress must create a level-playing field to ensure that competition continues to grow with different actors at the forefront. On one hand, we have companies like Amazon providing cloud services to Hulu which relies upon Internet Service Providers like Comcast to deliver content to customers. In such an environment, the current configuration of different regulatory silos remains an enigma. Companies are fulfilling multiple roles that would have been satisfied by diverse collaborators in the past, yet are regulated according to their original, non-comprehensive business models.

In order for the law to keep up with marketplace innovation the status quo must be challenged. USHCC urges Congress to implement flexible technology policies that encompass today's technological advances while offering equity across the board. This will allow businesses from the technology landscape to compete on neutral ground under the same rules. The incredible progress in communications technology in the past twenty years has been driven by a competitive market. Unfortunately, the marketplace has moved forward while the law has not. If Congress does not clear out the archaic regulatory silos and adapt the law for the reality of the market, phenomena like the wireless explosion of the last ten years may stall. An obstacle of this magnitude in the competitive outlook of the communications marketplace would be devastating to Hispanic and non-Hispanic consumers alike. To guarantee even greater progress in the next twenty years, the USHCC strongly encourages Congress to develop technology neutral, silo free laws to further Hispanic prosperity and America's well-being overall.

Thank you for your consideration. We look forward to working with the Committee on this important issue.

Sincerely,

Marc Rodriguez
Chairman of the Board
USHCC

Javier Palomarez
President & CEO
USHCC



COMPETITION POLICY AND THE ROLE OF THE FEDERAL COMMUNICATIONS COMMISSION

INTRODUCTION

The United States Telecom Association (USTelecom), the nation's oldest and largest association for providers of wired communications – first, traditional voice telephone companies and, today, broadband companies – appreciates this opportunity to once again provide the Committee on Energy and Commerce with its views on updating the nation's communications laws. Consideration of competition policy, as contemplated by this third white paper, is an essential element of any modernized or updated Communications Act. This is so because a large portion of Title II of the current Communications Act – most specifically, Part One of Title II (Common Carrier Regulation) – has not been significantly changed since President Franklin D. Roosevelt signed these provisions into law on June 19, 1934. Indeed, not only do sections 201 through 221 remain virtually the same in substance and application as they were when first enacted, these provisions were principally an adaptation to the Depression-era telephone industry of a statutory scheme initially developed for railroads in the Interstate Commerce Act of 1887.¹ The Communications Act of 1934 prescribed statutory provisions that produced a comprehensive scheme of monopoly regulation that is inappropriate today when there are competing services, devices, applications, and providers that are interchangeable, functionally equivalent, and substitutable.

BACKGROUND

The underlying premise of the 1934 Act was not competition but rather the monopoly provision of telephone services. The authors of the law, the Chairmen of the Senate and House Committees on Interstate and Foreign Commerce, attested to this clearly and unmistakably during Senate and House consideration of the legislation that President Roosevelt ultimately signed.² These provisions remain in effect today, with the Federal Communications Commission (FCC) currently inquiring whether these monopoly-oriented common carrier provisions should be made applicable to 21st-century broadband Internet access services. But this original 1934 framework, which granted “the old AT&T” an effective nationwide monopoly in long distance and a monopoly in local service in those areas where it operated, together with a guaranteed rate of return at regulated prices, ceased to be relevant when the monopoly parts of this equation vanished long ago.

¹ S. Rep. No. 781 at 2 (1934) stated: “In this bill many provisions are copied verbatim from the *Interstate Commerce Act* because they apply directly to communications companies doing a common carrier business....”

² United States Senate Committee on Interstate and Foreign Commerce Committee Chairman C.C. Dill told the Senate, “I think that it is generally well known by those who know anything about the set-up of the *telephone monopoly*, that under the present arrangement the parent telephone company, the American telephone and telegraph, not only owns the operating companies in the principal cities of the United States--I understand there are some 71 companies--but it owns the manufacturing company the Western Electric....” 73 Cong. Rec. 8824 (May 15, 1934) (emphasis added). See also 73 Cong. Rec. 10315 (June 2, 1934) (statement of Chairman Sam Rayburn).

A new paradigm was embraced in the Telecommunications Act of 1996. There, Congress sought to establish “a pro-competitive, deregulatory national policy framework” and thus move away from the natural monopoly orientation and assumptions of the 1934 Act. The pro-competitive aspects of the 1996 Act were established in Part II of Title II (Development of Competitive Markets) by removing barriers to entry into the local exchange market. When these provisions were enacted in 1996, the introduction of competition in the local exchange market had barely begun.

The 1996 Act failed, however, to address in any forward looking manner the circumstances that would ensue when telecommunications markets did become competitive. Consequently, regulatory disparity, regulatory silos, and regulatory arbitrage have become the order of the day notwithstanding the new pro-competitive deregulatory paradigm. Functionally equivalent, substitutable, and competing services are regulated differently based on the regulatory classification of the service, whether it is being offered as an information service or a telecommunications service, whether the service is a wireless or a wireline service, whether the service provider is an incumbent local exchange carrier or a competitive local exchange carrier, whether or to what extent Internet Protocol is used in the transmission of the service, the historical underpinnings of the provider, or whether the service is provided by an edge provider even if the service, although functionally equivalent to a wire or radio communication service, is not subject to the FCC jurisdiction.

An updated Communications Act should begin with the assumption that competition is the driving force behind investment, innovation, and consumer benefits. A highly prescriptive regulatory approach was entirely appropriate for the monopoly circumstances of 1934, but it is no longer appropriate. The 1996 Act did not anticipate and has not kept pace with the innovation unleashed by the competition of the last two decades. Congress should acknowledge in any update to the Communications Act that competition has arrived – and that a light regulatory touch is what will bring about the virtuous cycle of investment, new technologies, and consumer choice that Americans desire, rather than a continued *and failed* adherence to 19th century concepts repealed decades ago at the federal level for virtually every other “common carrier” industry.

DEFINING COMPETITION

The Committee’s questions begin by asking, “How should Congress define competition in the modern communications marketplace?” We believe that any such effort is fraught with potential difficulty, and the second sentence of the question provides the answer as to why this is so: Any definition of competition will not provide the flexibility necessary to accommodate a rapidly changing industry. Such a definition would quickly become obsolete, as would any revision of the Act that relied upon this definition. Not even the antitrust laws define competition; instead, the antitrust laws examine the actions of parties as those actions impact the marketplace that exists.

It is of course preferable to support government policies that will foster greater competition. But in the past, congressional attempts to include “effective competition” provisions in the Communications Act have not proven to be successful or enduring. When Congress enacted the

Cable Communications Policy Act of 1984, it included in the newly created Title VI a new section 623, which required the FCC to prescribe regulations authorizing a franchising authority to regulate rates for the provision of basic cable service in circumstances in which a cable system is not subject to “effective competition.”³ The FCC prescribed implementing regulations in 1985. The FCC was required to revise those regulations “in light of changed circumstances in the video marketplace” in 1991. The Congress revised the definition of the section 623 term “effective competition” again in the Cable Communications Protection and Competition Act of 1992, and the Telecommunications Act of 1996 revised this definition once again to include in the list of competitors local exchange carriers or their affiliates offering a comparable video programming services to subscribers. So, even for this discrete and limited purpose, the statutory definitional approach lacked the requisite flexibility to accommodate changed circumstances and new technologies.

In 1993, the Congress enacted section 332(c)(1)(C), requiring the FCC to annually review competitive market conditions for commercial mobile services and to submit to Congress a report with an analysis of those conditions. The analysis is required to include “whether or not there is effective competition.” Beginning with its Fourteenth Report, the FCC has determined that “there is no definition of ‘effective competition’ that is widely accepted by economists or competition policy authorities such as United States Department of Justice [DOJ].”⁴ It was the Obama Administration Justice Department’s position upon which the FCC relied in coming to that conclusion, a position provided initially to the FCC in an *ex parte* submission in the Notice of Inquiry proceeding with respect to the National Broadband Plan developed under then FCC Chairman Julius Genachowski’s leadership.⁵ The FCC, in that April 2009 National Broadband Plan Notice of Inquiry, had sought comment “on how we should define sufficient competition as we evaluate competition as a potentially effective and efficient mechanism for broadband deployment.”⁶ The FCC has continued to rely on this DOJ viewpoint in the Fifteenth and Sixteenth annual reports.

Rather than attempting to statutorily define competition – a definition that will inevitably become outmoded in a very short time – the time has come to move the communications industry away from the patchwork quilt described above of “regulatory disparity, regulatory silos, and regulatory arbitrage,” dependent more on a company’s lineage than on today’s marketplace realities. The first step in that process requires an acknowledgement that the communications

³ H. Rep. No. 98-934, at 66 (1984) provided, “In determining whether a cable system is subject to *effective competition* for the purpose of regulation of basic cable service the FCC should consider the number and nature of services provided compared with the number and nature of services available from alternative sources and if so, at what price. In establishing necessary regulations, the FCC should establish objective nationwide criteria which are readily applicable for determining on a community by community basis whether a cable system is subject to effective competition.” (Emphasis added).

⁴ *Fourteenth Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services*, FCC 10-81, ¶ 11 at 26 (May 20, 2010).

⁵ *Ex parte* Submission of the United States Department of Justice, GN Docket No. 09-51 (filed January 4, 2010): “[W]e do not find it especially helpful to define some abstract notion of whether or not broadband markets are competitive.”

⁶ *In the Matter of a National Broadband Plan for Our Future*, FCC GN Docket 09-51, Notice of Inquiry ¶ 49 (Apr. 8, 2009).

marketplace has, indeed, become competitive. Ev Ehrlich, a senior fellow at the Progressive Policy Institute, eloquently summarized this competitive reality in a March 2014 policy memo he authored entitled “A Brief History of Internet Regulation,”⁷ where he wrote:

“[P]erhaps the most subtle, yet pivotal, technological change that challenges our ideas about Internet regulation is the rise of devices, applications, and services, a change triggered by the introduction of the iPhone. The FCC’s various statements about the management of the Internet . . . have all been based on the view that the choke point in both telecommunications and information systems was the network itself – they were ‘network centric.’ The old phone system represented that view – the only purpose for the equipment you bought was to reach the network. But after the explosion in devices triggered by the iPhone, and the proliferation of ‘apps’ and services the iPhone has allowed us to imagine, the model of how broadband creates value has changed dramatically, as first discussed in a seminal paper on ‘the consumer value circle’ by Jonathan Sallet.”⁸

Mr. Sallet, now General Counsel for the FCC, described in a 2011 paper⁹ “a marketplace in which multiple players in separate product markets are capable of competing against one another – and capable of shifting roles quickly, while playing different roles simultaneously. A company’s supplier today may be its competitor and customer in tight sequence, or at the same time.”¹⁰ What he termed the “Broadband Value Circle” involved “a marketplace in which multiple companies, not necessarily in the same product markets, are able to offer competing packages of value to consumers.”¹¹ This circumstance “stems from economic forces – like modularity, interoperability, and common standards – that permit different products from different product markets to be ‘mixed and matched.’”¹² These factors have developed because the broadband communication market has taken on the characteristics of other aspects of our information technology sector, namely rapid innovation, product differentiation, and network effects resulting in the convergence of computer software and telecommunications industries.

In his paper, Mr. Sallet noted that “[f]or policymakers, the dynamic nature of the Broadband Value Circle means that competition and regulatory analysis must comprehend the true nature of competitive entry and market discipline. Rapid change creates uncertainty, which puts a premium on governmental oversight that is flexible and responsive, not rigid and preemptive.”¹³

⁷ E. Ehrlich, *A Brief History of Internet Regulation*, Progressive Policy Institute (March 2014) [<http://www.progressivepolicy.org/2014/03/a-brief-history-of-internet-regulation-2/>]

⁸ *Id.* at 17.

⁹ J. Sallet, *The Creation of Value: The Broadband Value Circle and Evolving Market Structures* (Apr. 4, 2011) [http://papers.ssrn.com/sol3/papers.cfm?_id=1821267]. Sallet’s paper focused on the wireless industry but Ehrlich’s overall analysis suggests there is no reason to believe the same construct and principles do not apply to the Internet ecosystem as a whole.

¹⁰ *Id.* at 14.

¹¹ *Id.* at 2.

¹² *Id.* at 12.

¹³ *Id.* at 3.

Similarly, the FCC's 2010 National Broadband Plan recognized that broadband is part of an “ecosystem” that includes “networks, devices, content and applications.”¹⁴ Indeed, market concentration in many other elements of that Internet ecosystem – browsing, search, operating systems, social media, geolocation, and other key applications on which consumers have come to rely – is at least as high if not higher for the vast majority of Americans than in voice or broadband access. Yet neither existing communications law nor the competition policies currently being proposed and implemented at the FCC are reflective of these new realities. Competition policies of the type identified below, and that are most aptly represented in the antitrust laws applicable to most other competitive industries in the United States, would be considerably more conducive to the future development of broadband investment, deployment, and adoption.

COMPETITION POLICY PRINCIPLES AND INTERMODAL COMPETITION

- First, the paramount competition policy principle should be that, regardless of platforms or technology used, services that are functionally equivalent, substitutable, or interchangeable from a consumer’s perspective should be treated in the same manner, with as light a regulatory touch as is consistent with the preservation and protection of the core values that all Americans expect and deserve – universal service, protection of public safety, consumer protection, and network reliability, and interconnection.
- Second, the FCC should no longer regulate transactions among business entities in the broadband ecosystem, and certainly not between communications providers, in the absence of a showing of a market failure. Such a hands-off approach would remove regulatory arbitrage as a business strategy.
- Third, competition and consumer choice should be relied upon rather than economic regulation, with regulatory intervention only if and where necessary to prevent market failure. In particular, competition from edge providers should be taken into account when considering whether to impose regulatory requirements on providers subject to the FCC's jurisdiction.
- Fourth, the merger review process should be limited to DOJ or the Federal Trade Commission (FTC). Duplicative review at the FCC imposes financial burdens on the parties to the transaction with little or no additional benefit to consumers or to competition. Other industry mergers, such as in the airline, oil and gas, and auto manufacturing industries are adequately reviewed by either the DOJ or the FTC. Even a hypothetical merger between two edge providers that are intermodal competitors, such as Google and Yahoo, would not be subject to FCC review, as there would be no licenses to be transferred or lines to be acquired. The transfer of lines or radio licenses is the basis of the FCC's current merger review authority. Consequently, a single competition review is all that is necessary.
- Finally, and in the same vein as the preceding paragraph, while the Supreme Court has held that it is entirely appropriate for regulatory agencies to consider and give some weight to

¹⁴ *Connecting America: The National Broadband Plan* (March 2010) at xi.

the national policies favoring competition as expressed in the antitrust laws,¹⁵ competition policy should be, first and foremost, the province of DOJ and the FTC, not the FCC.

PERIODIC REAUTHORIZATION OF THE COMMUNICATIONS ACT

The Committee's white paper inquires whether the Communications Act itself should require periodic reauthorization by Congress in light of the rapid change in the competitive market for communications networks and services. It is difficult to opine in the abstract on what the effect would be on markets and industries if the entire Act were to expire at once or be suspended in the event of a political stalemate without also knowing what the contents of an updated Act are. But we do believe that given how quickly these industries are innovating and evolving, there would be considerable merit in requiring that prospectively applicable rules rooted in market structure, concentration, or competition considerations be subject to periodic automatic sunsets, thereby spurring Congress to require the FCC to offer timely justifications for renewal of those rules.

Congress should also reinvigorate the process of reauthorizing appropriations for the FCC on a regular basis. The Act President Roosevelt signed into law in 1934 did not include such an authorization. Indeed, the inclusion of an authorization of appropriations in section 6 of the Communications Act did not occur until 1981 when, under the leadership of then Chairman Dingell, the Congress passed the Omnibus Reconciliation Act of 1981 (P.L. 97-35), signed into law by President Reagan. The goal of the authors was clear: They wanted to establish a more effective means of overseeing a regulatory agency that had been dealing with and would be continuing to deal with matters, entities, and technologies unforeseen by the authors of the 1934 Act, such as cellular telephone license allocations, competition in interstate telephone services, customer premises equipment, cable television, data processing, satellite communications, and most especially, the prospective aftermath of the *United States v. AT&T* antitrust case.

Congress passed reauthorization legislation in 1983, 1986, 1988, and 1990. Since 1990, however, Congress has not enacted another reauthorization bill, save for the 1993 and 1996¹⁶ amendments discussed below, the roots of which had no relation to Congress's oversight responsibilities. This failure has foreclosed an excellent opportunity, which was readily used from 1981 to 1990, to reevaluate the effectiveness and necessity of various provisions of the Communications Act.

Reauthorization legislation also provided then and can provide in the future an effective means to conduct oversight of the FCC, without the necessity enacting omnibus legislation. Discrete changes can be made to the Communications Act, without resort to comprehensive legislation. By way of example, in addition to addressing authorizations of appropriations and other housekeeping matters, the 1981, 1983, 1986, 1988, and 1990 bills substantively amended Titles I, II, III, IV and V of the Communications Act.

¹⁵ *McLean Trucking Company v. United States*, 321 U.S. 67 (1944).

¹⁶ Section 710(a) of the Telecommunications Act of 1996 authorized "such sums as may be necessary to carry out this Act and the amendments made by this Act." Section 710(b) amended section 9 of the 1934 Act with respect to regulatory fees to reflect the changes in the amounts necessary to be appropriated to carry out the additional activities described in section 710(a).

Prior to 1993, another means of effective oversight of the FCC was the annual appropriations process. In 1993, however, section 6 of the Communications Act was further amended and a new section 9 (47 U.S.C. 159), entitled “Regulatory Fees,” was also added to the Act. The 1993 amendment to section 6 provided that a portion of amounts appropriated for the FCC “shall be derived from the fees authorized by section 159 of this Title.” The regulatory fees that were established in 1993 reflected the categories of regulatees that provided wire or radio communications under the FCC's jurisdiction in that year.

Three problems have arisen as result of the 1993 changes to the Act. First, the offsetting effect of fee collections on appropriations has often diminished the interest or ability of appropriators to effectively exercise oversight on the agency. Second, the regulatees of 1993 vintage are bearing the near-totality of the burden of funding the FCC, even though the nature of these industries and their financial circumstances has changed dramatically over the last 20 years. Third, many entities who currently do not pay any of these regulatory fees engage in a form of regulatory arbitrage by actively advocating at the FCC for the imposition of more and stricter regulatory burdens on those regulated entities with whom they compete or from whom they purchase services so that they can compete with other regulated entities.

This issue was nicely captured in the following exchange between Vice Chairman Marsha Blackburn and FCC Chairman Wheeler on May 20, 2014 at the Subcommittee on Communications and Technology's FCC oversight hearing:

“Rep. Marsha Blackburn: Let me ask you this also. You know the Commission's funding really comes from those that are regulated by the FCC, but we have some that are not. They are impacted by this, but they are not regulated and paying those fees. So, in the net neutrality context, for example, companies like Google and Netflix want the FCC to act on their behalf and petition or visit the agency, if you will, in support of those efforts, but they free ride, because they are not paying the fees and bearing that part of the regulatory burden. So, since they seem so ready and willing to rely on regulation to help them with their business models, how would you recommend that those entities share in the costs, pay their part of the costs [of] funding the agency?”

“Chairman Wheeler: With all respect, that is above my pay grade. That is a decision that this Committee and the Congress can make in setting those rules.”

Two reforms are self-evident. First, the "Schedule of Regulatory Fees" in section 9 is in dire need of revision. Second, the free ride described by Vice Chairman Blackburn should end.



**MODERNIZING THE COMMUNICATIONS ACT:
COMPETITION POLICY AND THE ROLE OF THE FCC**

Verizon welcomes this opportunity to provide comment on the third in a series of white papers regarding the efforts by the Committee on Energy and Commerce to modernize the laws governing the communications and technology sectors. As the Committee recognizes, the telecommunications landscape has “changed dramatically” since Congress last revisited the Communications Act in 1996 “and will continue to evolve at a rapid pace.” There has been an evolution in technology and competition, accompanied by significant shifts in consumer preferences. The Committee is right to acknowledge that these changes have “called into question the adequacy of the current Communications Act and the monopolistic assumptions on which it is based.”

Indeed, whereas the Communications Act has its roots in 19th Century railroad regulation and was designed for regulating legacy communications services in a “Ma Bell” monopoly era, today’s telecommunications landscape looks markedly different. Quite simply, the world has changed. In the almost two decades following the last revisions to the Act, companies traditionally regulated by the FCC compete among themselves *and* with those historically outside the reach of the FCC. But current FCC regulations generally ignore competition among the platforms and services they regulate, and fail entirely to recognize competition with those they do not.

Today, consumers can choose to communicate in any number of ways, including voice, texts, tweets, e-mail, video chat, social networks and others, with the Internet and broadband networks providing a platform for continued innovations that will lead to even more choices tomorrow. Those consumers are no longer limited to taking service from just the legacy telephone company in their area. Consumers can obtain voice services from a variety of landline, wireless, satellite, Voice over Internet Protocol (VoIP) and other providers. Moreover, within the Internet ecosystem, network providers, applications providers, device manufacturers, online service providers and others simultaneously cooperate and compete to meet consumers’ evolving communications demands. As a result, consumers now experience dynamic competition among both platforms and services. This dynamic competition has several important implications for the governing policy framework.

I. Competition Should Not Be Defined and Regulated within a “Siloed” Approach.

As the Committee notes, the Communications Act currently consists of seven titles that define and govern seven specified sectors of the communications space in different ways, as if those sectors exist separately – without overlap – and warrant different treatment. At some point this may have been the case, but today it is not.

Technology and competition have evolved to the point where many communications players do not operate within just one of the traditionally defined sectors. More importantly, those distinctions do not matter from the consumer’s perspective. Consumers now have a variety of different options across and outside the traditional dividing lines of telco versus cable versus wireless versus satellite. They can choose voice, broadband and video services from multiple competing wireline, wireless and other providers, as well as utilize Wi-Fi in tens of thousands of hot spots across the country – and even in the air.

Consumers also now rely heavily on IP-based Internet services to communicate over-the-top, including e-mail, instant messaging, various forms of voice and video services (e.g., Skype, FaceTime or Vonage), social networking services and others. In these circumstances, consumers move from one platform to another and from one service to another many times throughout the day. Their choice of platform/service is determined by many different factors, including convenience, mobility, the intended audience, and the length and complexity of the message, as well as preferences for devices, operating systems, applications, platforms and providers.

Accordingly, the choices available to consumers as they decide how to communicate span the range of network providers, Internet companies, device manufacturers, operating system developers, application developers and others to meet consumers’ communications needs. All of these intermodal providers compete intensely to attract consumers and – in other contexts – collaborate with each other to develop innovative service offerings for the same purpose. This dynamic competition pays little attention to the boundaries drawn among the “silos” of the various regulatory sectors.

For example, Microsoft’s Skype and Apple’s FaceTime provide popular – and free – web-based alternatives to traditional telephone service. Similarly, Facebook competes with mobile carriers in the text messaging space with its \$19B acquisition of WhatsApp, and also reportedly plans to offer broadband access using drones. And, while Google’s main business is Internet search, it competes via YouTube with other video providers in the content/media space, competes via Android and Chrome with Microsoft and Apple in the operating system space, competes via GoogleVoice in voice communications, and competes via Google Fiber with cable and telephone companies in the broadband space.

In this respect, the Committee correctly observes that the current statutory framework “fails to contemplate or address the convergence and evolution of services in the modern digital

era” Nor does it make sense to continue to divide these overlapping sectors into separate “silos,” subject to different regulation based on the different types of network technologies used and the particular services provided. As the Committee notes, “[t]he practical result” of the current statutory framework is that “providers of functionally equivalent services – whether technologically or from the consumer perspective – are regulated in drastically different ways.”

Unlike their more heavily regulated counterparts, most of these competitors have not been subject to the same legacy regulatory regime which often requires permission to introduce new services and features or to move away from others that fail to meet consumer demands. Instead, these Internet-era competitors have had flexibility to quickly respond to consumers’ changing demands and innovate at broadband speed. This is not to suggest that the same type of prescriptive regulation that traditionally was applied to legacy voice providers now should apply to newer competitors and services from the other “silos.” Just the opposite: consumers will benefit most if Congress adopts a new policy framework that more accurately reflects the nature of competition in today’s communications marketplace and provides *all* companies in the communication and Internet ecosystem with the flexibility necessary to encourage innovation and investment, while simultaneously protecting consumer interests.

In short, a modern definition and approach should embrace the dynamic competition in today’s market, while allowing for future innovations and market participants. The statutory framework should be drafted and applied in a way that reflects all those players in the communications marketplace that are competing by offering functionally equivalent or similar services and cooperating in constantly changing ways to offer products and services for consumers.

II. Competition Policy Should Be Based on Key Principles that Account for Continuing Changes in the Marketplace.

Given the fundamental shifts in technology, consumer preference and competition, Congress should eschew simply tweaking around the edges of the current statute or targeting only the most out-of-date provisions. Instead, Congress should start from scratch and ask what would work best now and in the future, regardless of what was done in the past to achieve those core policy objectives. In place of today’s silos and inconsistent treatment across the full range of technologies or services now available to consumers, Congress should focus on a set of technology-agnostic policy principles to guide regulation and provide a level playing field going forward. In particular, a modern policy framework should be based on three technology-neutral principles:

- encourage investment and innovation,
- promote competition, and
- protect consumers.

Adhering to these principles will better allow for future adjustments as market changes, new technologies, and shifts in consumer preferences continue to arise and evolve.

Policymakers should take into account relevant consumer expectations of all players competing in the communications market in evaluating the best way to accomplish these principles. More specifically, to satisfy these goals, a workable 21st Century approach should have the following key elements:

A. ***Light-Touch Regulatory Regime.*** The new framework should borrow from what has been successful with respect to wireless and Internet services, which have proliferated largely outside of the more prescriptive, legacy framework that has been applied to traditional wireline voice providers and services. Internet services have been subject to the lighter touch regulatory approach applicable to “information services,” while Congress’ decision to require a less regulated approach to wireless services provided similar flexibility. That lighter touch has proven hugely successful, sparking competition and innovation. And it stands in stark contrast with the more traditional, permission-first approach that has been applied to regulated services and that is an anathema to innovation. What would have occurred if players like Apple, Google, Facebook or WhatsApp had been required to get approval from regulators prior to introducing innovations or making changes to better serve their customers? Lighter touch regulation allowed them the freedom to innovate – and the success of that approach provides a blueprint for how to proceed here.

B. ***Multi-Stakeholder Approach.*** A modern Act should embrace the flexible, multi-stakeholder governance approach that has been a key component in the Internet context, under which industry standards and practices are developed and used as a model for problem-solving as new issues emerge. This approach strikes the right balance for a diverse set of stakeholders, including consumers, academia, policymakers, technologists and private firms. After proving successful in the Internet context, the same multi-stakeholder approach can be expanded – particularly as Internet-based services and companies continue to take on an increasing role in communications.

C. ***Reliance on Competition rather than Economic Regulation.*** Today’s dynamic marketplace requires a change from the old ways of regulating. Congress should depart from the old, prescriptive model that inhibits innovation or invites regulators to pick winners and losers and second-guess providers’ choices in how best to serve their consumers and instead adopt an approach that relies on consumer choice and competition. Consumer choice should be the touchstone for any framework going forward and, in the presence of competition, should drive the market. Regulatory intervention should occur only if and where necessary to protect competition or consumers. After all, competition leads to the best outcomes for consumers, and government regulation generally should occur only where there is a demonstrated harm to competition or consumers and, even then, should be narrowly tailored to cure it.

D. ***Ex-Post Enforcement, Rather than Ex-Ante Regulations.*** Today’s framework is based on prescriptive regulation on the front end, which acts as a deterrent to subsequent innovation, investment and new entrants. To combat this, Congress should adopt an enforcement-based regulatory model under which government intervenes on an ex-post, rather

than ex-ante basis. This is similar to the approach the Federal Trade Commission (FTC) utilizes in competition matters; it can provide the flexibility necessary to encourage the kind of experimentation that is vital for economic growth, while still allowing government to step in if a problem arises. In other words, government should provide a backstop to address anti-competitive or anti-consumer behavior that occurs on a case-by-case basis. But the regulatory scheme should not preempt innovation with prophylactic, ex-ante rules that cannot keep up with changing technologies.

III. The FCC's Role in Competition Policy.

As a result of its outdated statute, the structure of the FCC's current jurisdiction creates a bureaucratic, multi-layered regulatory and legal playing field that often see-saws among companies providing functionally equivalent or similar services. Some companies in the marketplace are regulated heavily – often based on a dominant position from decades past which bears no resemblance to their position in today's marketplace – while no regulations or only light regulations apply to others. For example, “incumbent local exchange carriers” are often singled out for intrusive regulation such as unbundling, price regulation and the like based solely on their long-expired monopoly position, even as they have lost more than half of their customers in recent years to facilities-based competitors. Congress should ensure that all companies in the communication and Internet ecosystem operate under the same rules and that those rules reflect today's marketplace realities. But, rather than impose additional regulation on those previously subject to a lighter touch, the new framework should provide all parties the flexibility necessary to encourage innovation and investment, while simultaneously protecting consumer interests.

In that regard, Congress should move the regulatory approach in the communications area from an ex-ante, rules-based approach to an ex-post enforcement model, with the same regulator applying the same standards to all relevant marketplace participants. However, there are some areas unique to the communications space that deserve particular focus. Given the special nature and importance of issues such as public safety/911, universal service, disabilities access, and spectrum management, Congress should consider particularized provisions to manage these important areas as technology and the ways people communicate continue to evolve.

With respect to spectrum policy, it is vital that there be a federal government agency with responsibility for spectrum management and ensuring that spectrum is being used in a manner that best serves consumers. Making more spectrum available is essential to satisfy consumers' increasing demand for mobile services. Congress should take the lead on identifying and cultivating long-term spectrum solutions for commercial use in future auctions and in identifying and freeing up federal government spectrum for licensed use. Regardless of the precise form these solutions may take, it is essential to make spectrum available to competitors without unnecessary strings attached. Competition and, ultimately, consumers will benefit if more spectrum is made available to more competitors on reasonable terms.

IV. The Communications Act Should Be Subject to Periodic Review and/or Sunset.

Given the rapid changes in technology, competition and consumer choices that take place in the communications market, a mechanism for automatic review or sunset of regulation should be built into the Act and into agency regulations. Maintaining a statutory scheme that no longer fits with current conditions can harm consumers and competition. These concerns can be alleviated by adopting a flexible approach that allows for experimentation and innovation, with a government backstop as needed to address harm to competition or consumers. But Congress nevertheless should establish a sunset on the new provision it adopts in the Act or – at minimum – establish periodic review of the Act’s provisions on a going forward basis.

CONCLUSION

As the Committee recognizes, there is a significant disconnect between the existing statutory framework and today’s highly competitive communications marketplace. The current Communications Act reflects a legacy regime designed to prescriptively regulate monopoly voice services and to pigeonhole different providers and services into different sectors subject to different (and inconsistent) requirements. That regime does not fit in a world with dynamic competition and technology that traverses the traditional silos defined by the Act. Congress should take this opportunity to build a new framework that reflects the realities of today’s marketplace and builds on the lessons learned from the wireless and broadband industries, protecting consumers and competition, while adopting a light regulatory touch to encourage the investment and innovation necessary to develop new solutions and meet evolving consumer preferences.

Dear Members of Congress,

My name is Karen S. Rheuban, MD and I serve as Board Chair of the Virginia Telehealth Network, Past President of the American Telemedicine Association and Director of the Center for Telehealth at the University of Virginia. High speed Internet is a critical component of our telemedicine program which provides services to patients and providers across the Commonwealth.

As you deliberate broadband policy, I thought you might be interested in the below 2103 op-ed I authored in the [Roanoke Times](#), "Broadband is transforming and saving lives" (included below) about the importance of this revolutionary technology for transforming the delivery of care. In the year since that piece was published, through our UVA program we have increased our services provided to Virginia patients to more than 40,000 clinical encounters, serving patients from the Eastern Shore of the Commonwealth to far southwest Appalachian Virginia. We have saved Virginia patients more than 9 million miles of driving for access to healthcare, and have provided services in more than 45 clinical specialties. Those services include life saving treatments for acute stroke, screening programs for diabetic retinopathy to prevent blindness, care to pregnant women through telemedicine that has reduced preterm Newborn ICU days by nearly 50%, emergency mental health assessments to patients in community hospital emergency rooms, and we have reduced by 51% all cause hospital readmissions for patients through the use of remote patient monitoring tools.

Affordable broadband connectivity is a critical element of our program, without which our telemedicine network in the Commonwealth could never have flourished. We connect via wireless and wireline broadband services, and we have utilized the FCC Universal Service Fund programs to connect many of our 128 partner healthcare facilities across our state. With additional state and federal policy advancements, we expect that virtually every healthcare facility will join the Commonwealth's telemedicine networks to improve access, and lower costs.

It was my privilege to chair the 2012 Institute of Medicine Workshop on Telehealth, and I urge you to continue to reflect on the significant healthcare applications of broadband. I would be pleased to provide any assistance to you in your deliberations.

Sincerely, and best wishes,

Karen

Karen S. Rheuban MD
Board Chair, Virginia Telehealth Network
Past President, American Telemedicine Association
Director, University of Virginia Center for Telehealth

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Broadband is transforming and saving lives

By Karen Rheuban

<http://ww2.roanoke.com/editorials/commentary/wb/320281/>

Thursday, February 14, 2013

For many Virginians, broadband connections facilitate e-commerce, web searches, video streaming, social media updates, online and video chat in addition to many other daily activities. While all of these uses are important applications, there is a growing class of Internet users for whom a high-speed Internet connection is not just useful; it is lifesaving.

Telemedicine is a valuable tool for those seeking medical care when access to those services may be limited by local provider shortages or distance to specialty care. Telemedicine tools supported by secure broadband communications services have been proven to save lives, to mitigate chronic illness and to prevent hospital readmissions. Whether it be connecting a rural patient suffering from an acute stroke to a neurologist trained to remotely evaluate and direct the administration of life-saving clot-dissolving treatments, or a woman experiencing complications of pregnancy needing high-risk obstetrical care, or a newborn with a heart murmur for whom a timely decision to transfer to a critical care nursery many miles away has profound implications, or a chronically ill patient suffering from heart failure who can be effectively monitored in the home — telemedicine allows for patients to receive the highest quality of care regardless of location or condition.

Telemedicine has been proven to both reduce costs and improve care quality in the commonwealth. In the examples provided above, telemedicine programs in participating Virginia hospitals have increased tenfold the use of clot-dissolving therapies for acute stroke. The burden of pre-term delivery has been reduced by as much as 25percent. Thousands of infants suspected of having congenital heart disease have been evaluated, with transfer required for only those few needing newborn critical care. Hospital readmissions for adult heart failure patients have been reduced by as much as 90 percent. The University of Virginia Telemedicine program has reduced the burden of travel for access to health care for Virginians by more than 7.8 million miles.

Virginia leads much of the nation in telehealth deployment. A recent study showed that 54 percent of hospitals in the commonwealth have instituted telehealth services, whereas the national average rests at 42 percent.

In addition to greater numbers of hospitals adopting telehealth services, with a dramatic increase in broadband speeds, coupled with favorable state and federal policies, the diversity of telehealth applications has flourished in the commonwealth.

Faster speeds and stronger connections result in higher quality doctor-patient interactions and faster transmissions of critical radiology studies that support consultations when time is of the essence.

Electronic Health Records represent another example of broadband-enabled health information technology tools that have proven benefits and offer promise for the future.

The ability for both doctors and patients to access health records from any location will greatly improve care and reduce redundancy of services. With appropriate patient consent, and in particular, in the event of a medical emergency, the ability to electronically exchange key elements of the electronic medical record offers great promise to save lives, reduce complications and improve quality of care. With leadership from the commonwealth and with input from partners from across the state, Virginia is building its statewide health information exchange, Connect Virginia.

The Virginia Health Workforce Development Authority has recently funded a training program in telehealth to support the growing need for appropriately trained individuals.

Broadband access is transforming our lives. In the commonwealth and across the nation, the health care community continues to lead many of these efforts to increase access, improve quality and lower costs — the triple aims of health reform.

As President Obama pursues his second-term agenda, we hope to see an even greater focus on health care services and options that capitalize on the great technological advancements in telehealth and provide a series of solutions for the path forward.

June 11, 2014

Wayne Winegarden, Ph.D.
933 N. Kenmore Street
Suite 405
Arlington, VA 22201

Members of the Panel,

Thank you for the opportunity to submit comments regarding the importance of modernizing the U.S. Communications Act. The House Committee on Energy and Commerce's premise for modernizing the Communications Act is that the foundation of U.S. regulatory policy toward the communication and technology sectors is outdated. It is. Paramount among the anachronistic regulations is how the Federal Communications Commission (FCC) defines competition.

The FCC's goal is to promote a competitive market for communication services in order to ensure that all consumers have access to affordable communication and broadband services. However, the goal of promoting competition is thwarted by the FCC's practice of categorizing communication services by the type of technology used to provide the service (the traditional medium). The current market structure is developing in such a manner that competition can no longer be defined by the type of technology used – instead competition now transcends these traditional barriers.

Consider just a sampling of the consumer-enhancing competition that is occurring between companies that have traditionally been part of different industries.

- Apple dropped “computer” from its name in recognition of its broader service offerings. It is now competing with traditional cable providers through Apple TV.
- Amazon is now the largest online retailer in the world, (Amazon was originally an online book seller). Amazon has introduced Fire TV (a direct competitor to Apple TV) and provides an online streaming service (Amazon Prime) that competes directly with Netflix.
- Netflix originally leveraged the Internet and the Postal Service to deliver traditional DVD videos to consumers allowing consumers to rent videos without having to physically drive to a store (in an earlier version of the creative destructive process Netflix drove the likes of Blockbuster and Hollywood Video out of business). Netflix now has the largest online streaming library. Of course, fierce competition from Hulu Plus and Amazon Prime are providing consumers with more streaming choices. Just to blur the competitive lines more, Netflix and Hulu Plus are now generating original programming.

All of these companies are the current pioneers of the Information Age. Their new competitive offerings bring new services to consumers and empower consumers with more choices in terms of services and providers. Traditional providers are adjusting their service offerings, consequently, in the hopes of avoiding Blockbusters fate.

This process is the essence of market competition. And, this is just one of the technology spaces. Competition in the traditional telephone service is evolving quickly as Skype (owned by Microsoft) and

FaceTime (an Apple offering) are changing how people use traditional telephone service. Similarly, changes in the cloud computing space, the social networking space, and the wireless broadband space are re-defining our understanding of communication services.

The dynamic competition that is occurring in the traditional telecommunications market space is making life difficult for many companies. Dynamic competition forces companies to strive for continual innovation and ensure that their service offerings provide value to their customers. If consumers' desires go unmet by current providers, then there are many new potential providers willing and able to meet their needs. In other words, the current market dynamics are fulfilling the FCC's goal of ensuring consumers have access to affordable communication and broadband services. It also exceeds the FCC's goals by bringing communications and broadband services to consumers that neither the FCC nor the consumer knew they wanted.

Keeping the dynamic and broad scope of competitors in mind, the revised FCC regulations should not regulate companies based on the technology platform from which the services are being provided. For instance, it makes no sense to regulate phone services via a data network (VoIP) differently than phone services via a traditional telephone network. From the consumers' perspective, the services being provided are exactly the same.

Worse, attempts by the FCC to regulate by technology will inevitably lead to circumstances where the FCC is burdening one company with expensive regulations that a competing company, providing exactly the same service from the consumers perspective, does not need to bear. The result will be an inefficient reduction in the regulated company's potential market share and excessive costs on the consumer.

In fact, the FCC's strategic plan for 2009 – 2014 states that "Regulatory policies must promote technological neutrality, competition, investment, and innovation to ensure that broadband service providers have sufficient incentive to develop and offer such products and services."¹ Such sentiments should guide all efforts to modernize the Communications Act.

Thank you for your time and consideration of my comments.

Sincerely,

Wayne Winegarden, Ph.D.
Contributing Editor, EconoSTATS at George Mason University
Sr. Fellow in Business and Economics, Pacific Research Institute

¹ <http://www.fcc.gov/encyclopedia/strategic-plan-fcc>.



June 13, 2014

The Honorable Fred Upton
U.S. Representative for the 6th District of Michigan
2183 Rayburn House Office Building
Washington, D.C. 20515

The Honorable Greg Walden
U.S. Representative for the 2nd District of Oregon
2182 Rayburn House Office Building
Washington, DC 20515

Re: WISPA Response to White Paper on Competition Policy and the Role of the
Federal Communications Commission

Dear Representatives Upton and Walden:

The Wireless Internet Service Providers Association (WISPA) appreciates the opportunity to respond to the House Energy and Commerce Committee's May 19, 2014, white paper on competition policy and the role of the Federal Communications Commission (FCC).

As background, WISPA is the trade association representing the interests of the fixed wireless broadband industry. WISPA's members include more than 800 wireless Internet service providers (WISPs) that provide fixed wireless broadband service to millions of consumers and businesses in rural, suburban, and urban areas, in the vast majority of cases without federal universal support. WISPs rely primarily on unlicensed spectrum in the 900 MHz, 2.4 GHz, and 5 GHz bands and "lightly licensed" spectrum in the 3650-3700 MHz band to deliver last-mile service, and use a combination of unlicensed and licensed links and fiber for backhaul and point-to-point connectivity. Some WISPs have added fiber technology to their fixed wireless networks, either as middle-mile or last-mile connections, and others are including VoIP services.

In many rural areas of the country, WISPs provide the only terrestrial fixed broadband service because base stations can be established on a cost-effective basis in areas where cable, DSL, and fiber technologies cannot be economically justified due to sparse population that extends investment recovery beyond acceptable time periods. In urban and suburban markets, WISPs often compete with wired technologies – some of which have received millions of dollars in federal Universal Service Fund (USF) support – to provide broadband service. Given this

background, WISPA is well-qualified to respond to questions concerning competition policy and the role of the FCC, particularly with respect to fixed broadband services.

In response to **Question #1**, WISPA believes that Congress should define competition based on the availability of like services and the level of consumer choice to access such services in a given area. Congress should not choose one technology or one regulatory category over another, but rather should endeavor to adopt technology-agnostic legislation (legislation that is technology neutral) and direct the FCC to promulgate rules that similarly do not pick winners and losers. As an example, Congress could adopt a broadband version of the USF that treats all broadband providers equally regardless of technology, in contrast to the current system that preserves regulatory silos enabling only providers of “telecommunications” services to obtain federal support for broadband deployment and access to utility poles on fair and non-discriminatory terms. This legislative construct creates a significant competitive disadvantage for WISPs who compete with subsidized carriers and may not be able to negotiate pole attachment rights.

In response to **Question #2**, two principles should form the basis for competition policy. First, legislation and regulation should be based on the services that the consumer receives and not on the technology over which those services are delivered. Second, policies should reduce barriers to entry to encourage intramodal and intermodal competition. Taken together, these principles would mitigate the harmful competitive effects resulting from legislative silos that – in an environment where innovation is facilitating the convergence of video, voice and data services across multiple delivery platforms – treat similar services differently.

In response to **Question #3**, competition in both geographic and product markets should compare the services that are available to the consumer. The technology platform used to provide services should be considered alongside other platforms that deliver the same service to the consumer.

In response to **Question #4**, the FCC should not be solely an enforcement agency, but should retain jurisdiction over vital functions such as spectrum and interference management, device registration and international coordination. These functions help define and support international standards and harmonization of rules and devices, and provide confidence and certainty to the investment community. Further, WISPA believes that it is necessary for the FCC to retain broad rulemaking authority, consistent with Congressional policies. When fairly and effectively implemented, rules can promote service quality and level uneven playing fields.

In response to **Question #5**, WISPA notes that the regulatory classifications that treat “telecommunications” services differently than “information” services have created a competitive disparity in the broadband marketplace. In short, small-business standalone broadband providers must compete with well-heeled telephone companies that have significantly more financial resources and are eligible for federal support. This situation threatens to worsen as the FCC allocates billions of dollars to price cap carriers – and only price cap carriers – that will rely on Connect America Fund (CAF) Phase II support. While these funds may not be used

to fund direct competition with unsubsidized broadband providers, large companies will have more freedom to use their own funds to compete. WISPA appreciates that the telephone companies must also provide voice, but the new CAF is essentially a broadband subsidy program that requires voice only because of the regulatory classifications. A better result – one that promotes competition and ensures that subsidies are going only to areas that do not already receive broadband service – would be to treat all broadband providers the same for CAF eligibility purposes. As the expert agency on spectrum management and interference mitigation, the scope of the FCC’s jurisdiction should not be altered.

In response to **Question #6**, FCC policies have long preferred wealthy investors over start-up companies. The FCC will have to change its perspective on spectrum auctions and spectrum in general in order to allow for innovation and new entrants into the market. The recent emphasis on creating a balance between licensed and unlicensed spectrum must be consistently applied going forward. With regard to spectrum auctions, the FCC has largely failed in its ability to encourage participation by smaller entities, and efforts should be made to increase participation by auctioning smaller geographic areas (as the FCC proposes in the 3550 MHz proceeding (ET Docket No. 12-354)) and by increasing bidding credits for very small businesses and entrepreneurs.

The conundrum is whether the FCC should adopt *a priori* rules based on its “predictive judgment,” or whether to allow marketplace forces to identify the need for *post hoc* regulation. By establishing rules in advance, the FCC runs the risk that its judgment will be wrong; if it waits for the market to identify competitive imbalance, participation may already be foreclosed. As an example, it may be imprudent for the FCC to establish rules that restrict certain categories of businesses from participating in spectrum auctions, but it may be wise for the FCC to encourage participation in auctions by auctioning small areas and allowing generous bidding credits for small businesses and other designated entities.

In response to **Question #7**, WISPA believes that the FCC should be involved in merger analysis where those mergers will impact spectrum concentration, competition and availability of spectrum. The FCC also should examine concentration and market power of the combined entity. WISPA agrees that the FCC’s statutory public interest mandate compels a broader examination of mergers beyond antitrust concerns.

In response to **Question #8**, edge providers need access to ISP networks. However, the FCC should not be looking at peering arrangements. To the extent that peering agreements require scrutiny to determine whether they are foreclosing competition, the Federal Trade Commission should have enforcement authority.

In response to **Question #9**, WISPA believes that Congress should pass legislation that establishes timelines for the FCC to act in rulemaking and merger proceedings. Too often, decisions are not made in a timely manner. In some cases, spectrum lays fallow when it could be allocated for public use.

The Honorable Fred Upton
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In response to **Question #10**, Congress should not periodically reauthorize the Communications Act. The problem with communications regulation is not the FCC, but rather an archaic statute that is based on silos that no longer make sense in a 21st century IP-based environment, an environment where video, voice and data services are converging. The FCC is an expert agency and performs vital engineering and spectrum management functions that should not be subject to uncertainty. Further, WISPA believes that the threat of reauthorization (or non-authorization) will create substantial uncertainty that will have severe consequences on investment into the telecommunications and media industries.

Please feel free to reach out to WISPA for any additional information or support we could provide. If you have any questions or would like to discuss further, please feel free to contact me at [REDACTED]

Respectfully submitted,



WISPA Legislative Committee Chair

www.wispa.org

cc: David Redl
Ray Baum
Shawn Chang

**Response of WTA – Advocates for Rural Broadband to the
House Energy and Commerce Committee’s White Paper on Competition
Policy and the Role of the Federal Communications Commission**

June 13, 2014

In its White Paper on Competition Policy and the Role of the Federal Communications Commission, the House Energy and Commerce Committee (Committee) requests public comment on several issues regarding competition in the communications market and the role of the Federal Communications Commission (FCC) in light of such competition.

WTA – Advocates for Rural Broadband (WTA) welcomes the opportunity to comment on these matters. WTA is a trade association representing more than 250 rural telecommunications providers that serve some of the most remote, difficult and expensive-to-reach areas of the country and are providers of last resort to those residing there. Whereas WTA members were predominately providers of traditional voice services over copper networks during the early 1990’s when the Telecommunications Act of 1996 was being debated and enacted, they have more recently been evolving into providers of increasingly higher-capacity broadband data, video and voice services over hybrid fiber/copper networks, and are also in the midst of converting from Time Division Multiplexing (TDM) to Internet Protocol (IP) technology.

In its response to the Committee’s initial White Paper on Modernizing the Communications Act, WTA emphasized that the Committee should keep in mind the following three key points: (1) the communications industry and technology have changed over the decades, yet many of the principles underlying current law remain sound; (2) rural areas of our

country served by WTA's members have different market dynamics than more suburban and urban areas and continue to need regulatory structures tailored to these unique circumstances; and (3) federal universal service policies for areas served by rural local exchange carriers (RLECs) have helped to ensure that consumers living in high-cost rural areas receive services reasonably comparable in quality and price to those in more densely populated areas. WTA reiterates the validity and importance of these three principles and emphasizes that nothing it states herein with respect to the Committee's competition and FCC questions is intended to modify or reduce the primacy of these principles.

Competition and the Basis of Competition Policy

Whereas competition is one of those conditions of which people often say that "they know it when they see it," it is very difficult to define for statutory purposes, particularly in a time of rapid technological and economic change. Among other things, one has to look at: (a) the geographic scope of the market involved; (b) the consumer needs that are being addressed; (c) the relative prices and qualities of the products and services that are being compared; and (d) the relative sizes, ages and financial resources of the purported competitors.

Before proceeding to these factors and their complexities, WTA notes that the principle that should form the basis of national competition policy is access – that is, the ability of all residential and business end-users to contact and communicate with all other residential and business end users via reasonably comparable connections at reasonably comparable prices. This principle recognizes the fact (known as the network effect) that a network becomes more and more valuable to everyone that uses it as more and more people are connected with it. It builds upon the success of existing universal service mechanisms that have enabled about 95 percent of Americans to obtain traditional voice telephone services, and should guide the development of the future universal service mechanisms that will be needed to achieve similar levels of adoption and usage of evolving broadband services. From a competition standpoint, the key access issue is likely to be IP interconnection, as the Congress, the FCC and other agencies increasingly are going to be called upon to make sure that the Internet does not become the exclusive or near-exclusive domain of large peering entities, and that smaller broadband service providers and their customers are

able to obtain sufficient and affordable access to all of the information, services and people available over the public network of networks.

WTA also observes that the best legislative treatment of competition to date may be the definition of “effective competition” with respect to multichannel video distribution services in Section 623(l)(1) of the Communications Act, and the mechanism established by Section 623(a)(2) of the Communications Act to eliminate the regulation of basic tier cable television service rates where such “effective competition” is demonstrated to exist. Although this construct is not perfect and is likely to have resulted in some unnecessary expenses and delays, it is also flexible enough to have remained reasonably relevant over a 22-year period (it was enacted as part of the 1992 Cable Act] during which video distribution technologies and services have changed. It is sufficiently comprehensive to take into consideration the specific geographic market involved, the nature and relative equivalence of the services involved, and the relative sizes of the alleged competitors.

Geographic scope of the market. Evaluating the success of the nation’s telecommunications policies must take into account the differences between the more rural areas typically served by smaller telephone companies and the more urban and suburban areas typically served by larger companies. The objective of fostering competition in urban and suburban areas has worked well. Competition among multiple wireline carriers and multiple wireless carriers in urban/suburban markets should continue to ensure that fiber optic and wireless broadband facilities are extended, that broadband speeds and bandwidths are increased, and that broadband services continue to be deployed in response to customer requests and preferences.

However, competition has not had the same effect in rural areas as in urban and suburban areas, largely because of issues associated with geography and demographics. In the first place, rural areas lack the population densities and profit opportunities that encourage multiple communications providers to build expensive competing networks and vie for the business of rural consumers. Second, even where some potential rural competition does exist, it is virtually always limited to local population centers such as small cities and large

towns, and virtually never extends into the extensive farming, ranching, forest, mountain and desert areas surrounding them.

The prime case in point is cable television (CATV). Notwithstanding claims by some that CATV competes with wireline telephone service throughout most of the United States, WTA members can attest that in a large number of such instances, their “cable competitor” is in fact their own CATV or IPTV (Internet Protocol television) affiliate. Where the larger national and regional CATV operators compete in rural areas, their service areas are virtually always limited to the boundaries of substantial population centers. Likewise, to the extent that wireless services are deemed to “compete” with wireline services in rural areas, reliable wireless service is frequently limited to population centers and major highways, and generally becomes more and more sporadic as one moves into more sparsely populated and less heavily trafficked areas.

A major issue is how to define markets geographically for competitive purposes. In addition to international, national and regional market boundary issues, there is the “donut and hole” issue in rural areas. Should regulatory consequences follow where an RLEC and a CATV operator compete in a town (the donut hole), but where the RLEC network also serves a substantial surrounding farming area (the donut) that the CATV operator does not serve? Or should competition be deemed not to exist unless the CATV operator serves the same area as the RLEC, or unless both the CATV operator and the RLEC serve the same areas (an impracticable alternative if the CATV operator is a multiple system operator that serves hundreds or thousands of franchise areas throughout the nation)?

Consumer needs addressed. In its initial White Paper on Modernizing the Communications Act, the Committee correctly noted that service convergence and intermodal competition have increased since the 1996 Act. As indicated above, WTA members are prime examples of this convergence as they have evolved since the early 1990s from providers of analog voice telephone services into providers of an increasing array of digital broadband data, video and voice services. These technological changes are not slowing down, as computers and telephones are merging toward a common instrument, as sensors and other devices

increasingly connect things as well as people to the public network, and as the array of available information and social networking services continues to expand rapidly.

Defining competition in a rapidly changing environment is a very difficult task that can have unforeseen adverse consequences if assumptions turn out to be wrong and/or criteria are not sufficiently flexible to accommodate change. For example, despite the potshots and posturing between certain advocates of each sector, wireline and wireless services are actually far more complementary [as opposed to competitive] services. Notwithstanding stories about “cutting the cord,” the substantial majority of American businesses and households currently subscribe to both wireline and wireless services. More than 60% of American households subscribe to wireline voice service despite the benefits of mobility provided by cellular phones.¹ In addition, most cellular phone users transfer to a local WiFi network, which is typically a wireline network with a wireless router attached, whenever possible. Wireline and wireless broadband services presently utilize different equipment and technologies and are used by customers for different purposes and at different times and places. For example, a businessman may use wireline broadband service at work and at home, and wireless broadband service while traveling and commuting. These differences, as well as the trade-offs that end-users are willing to make regarding matters such as speed, capacity, file size, screen size and mobility, mean that wireline and wireless facilities and services should continue to play separate but complementary roles in the future of the public network.

WTA is well aware that iPhones and other portable wireless devices are particularly popular among young adults living with their parents, on campuses, ingroup housing, and/or in transient situations where they are likely to move frequently. This makes perfect sense, as it avoids establishing and re-establishing wireline service and changing telephone numbers. Whether this “wireless only” service is a passing phase or a long-term trend is

¹ CDC, *Wireless Substitution: Early Release of Estimates From the National Health Interview Survey, January–June 2013*, December 2013. <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201312.pdf>

not likely to become clear until economic conditions improve, and more and more young adults are able to settle down and establish long-term households. In the meantime, the Committee needs to keep in mind that wireless service will not work at all without an underlying wireline network that transports wireless calls to and from cell towers and the network backbone, and that it will become overly congested without wireline networks to carry high volume and high capacity traffic.

Relative prices and qualities of compared products and services. Competition requires that the vying products or services be relatively equivalent. Whereas they all constitute alternatives for enabling a person to get from one place to another, bicycles, automobiles, speedboats and airplanes are not considered to compete in the same markets. This is equally true in the telecommunications industry where a 1.5 Megabits per second (Mbps) downstream/768 Kilobits per second (kbps) upstream broadband service should not be deemed to compete with a 10 Mbps downstream/1 Mbps upstream broadband service. Likewise, voice services characterized by dropped calls, dead spots and broken or static-filled transmissions should not be deemed to compete with quality voice services.

A major concern of WTA has long been that the use of reverse auctions to minimize federal high-cost support in rural areas will result in a “race to the bottom” wherein competing bidders will game auctions by offering to accept wholly insufficient and inadequate amounts of support. This is a lose-lose situation wherein either (a) the under-bidder will defeat *bona fide* service providers that made realistic bids and then come back later to request a significantly increased amount of support; or (b) the under-bidder will deploy and maintain a low quality network with the inadequate support it requested [assuming it does not go out of business].

Relative sizes, ages and financial resources. Most small carriers lack the financial and staff resources to compete or negotiate on an even basis over the long term with large carriers. Whereas some RLEC affiliates have conducted successful competitive local exchange carrier (CLEC) businesses in rural price cap exchanges, this has been more the exception than the rule. Where larger entities have vigorously sought to protect or expand their

businesses, they have had the resources to undercut the pricing of smaller carriers or to tie them up in lengthy and expensive litigation or negotiations.

It is unrealistic for the Committee to expect RLECs and other small carriers to negotiate on a level playing field with the large national and international telecommunications carriers, cable operators, and content providers. Put simply, the amount of business that a large entity might do with small carriers is normally not sufficient to constitute a line item on the large entity's financial statements. Consequently, it is very difficult to get a large entity even to respond to RLEC and other small company proposals and requests.

This will become an increasing problem as the telecommunications industry completes its transition from a TDM to an IP world. The current Title II (Sections 251 and 252 of the Communications Act) interconnection provisions and the currently transitioning access charge – reciprocal compensation regime have enabled RLECs and their rural customers to obtain reasonable and affordable access to the public network. Whereas WTA and many other interested parties believe that Sections 251 and 252 remain applicable in an IP world, other entities assert the contrary. It is equally clear that large backbone providers have little or no interest in establishing peering relationships with small carriers, that demands will be made in the future by larger carriers for increased compensation to carry RLEC traffic to the Internet, and that these larger carriers may require RLECs to have their traffic hauled to and from distant hubs in major cities rather than to closer nodes. The end result will be much more expensive access by rural residents to the Internet and second class citizenship for those who will be unable to afford to participate in what is increasingly becoming the nation's central meeting place for business, educational, health, government and social purposes.

Conclusion. Whereas promotion of competition has long been an established Congressional and FCC policy, the design of a detailed statutory competition structure in a rapidly changing industry is much more difficult and complex and is likely to result in unforeseen consequences. WTA has listed some of the factors and considerations that should be incorporated into such a framework, but is not at this point proposing a detailed statutory

definition of “competition” or “effective competition.” However, whether incorporated into a comprehensive competition policy or considered separately, reasonable and affordable access by all service providers and their customers to the public network is essential in an IP world. The Committee needs to make sure that the rapidly developing IP broadband network, like its predecessor TDM telephone network, remains “available, so far as possible, to all of the people of the United States, without discrimination . . . a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges . . .” as has been long and ably required by Section 1 of the Communications Act.

Role of the FCC

The telecommunications industry is currently in the midst of a landmark transition from a TDM world to an IP world that will affect the nation for decades to come. This is not the time to drastically change the FCC’s mission or jurisdiction. And it is particularly not the time to transform or transition the FCC into an enforcement agency along the lines of the Federal Trade Commission (FTC).

In the first place, the two agencies have wholly different missions and jurisdictions, and operate under wholly different conditions and circumstances. The FTC has jurisdiction over antitrust enforcement and consumer protection with respect to most of the nation’s industries. It simply does not have the time or resources to study hundreds of industries in detail and develop specific rules to govern the antitrust and consumer protection practices of each particular industry. Rather, the FTC waits for complaints to be brought to it, and then determines which complaints merit the initiation of investigations and enforcement actions. In contrast, the FCC’s mission and jurisdiction are focused upon the telecommunications industry, and it consequently has the time and resources to develop substantial knowledge and expertise in telecommunications matters.

Second, reliance solely upon enforcement activities is not an efficient or effective way of regulating a rapidly changing industry. Even where very clear rules and policies exist, it can take several years to investigate certain activities, prepare a complaint, litigate pre-

hearing motions, conduct discovery, prepare for trial, conduct a trial, prepare proposed findings and conclusions, await a decision, litigate appeals and obtain a final ruling. During that time, the technologies, services or practices subject to the enforcement action are likely to have become outmoded and to have been superseded by one or two succeeding generations. Moreover, in an enforcement-only environment, the assumption that rules and policies will be clear is unlikely to be true. Rather, the propriety or impropriety of practices is likely to be resolved on an individual case basis, such that industry participants will not know until an enforcement action is completed whether a particular practice is lawful, and even then matters may remain uncertain because different entities can claim different circumstances.

The FCC presently has the ability to consider and adopt general rules and policies, to issue orders interpreting and clarifying these rules and policies, and to conduct enforcement actions to determine whether particular entities have complied with them. This range of approaches gives the FCC important flexibility to get out in front of certain issues and to wait to see how others develop before taking a variety of potential actions. This is precisely the type of flexibility an agency needs to deal with a rapidly changing industry.

The Committee is well situated to monitor the FCC's exercise of its jurisdiction and discretion and to take appropriate oversight, budgetary or legislative actions when course adjustments are required. There is no need, at this time, for Congress to engage in periodic reauthorizations of the Communications Act. Given the possibility for substantial changes and unforeseen consequences, periodic reauthorizations would be very likely to result in uncertainty and instability that would discourage the substantial and long-term infrastructure investments that must be made to respond to technological changes and consumer demands.

Finally, WTA understands the FCC's proposed *Open Internet* rules to be directed at regulating service provider blocking and pricing of services to edge providers and not to constitute regulation of the edge providers themselves. At some time, it may become

necessary for Congress to consider giving the FCC authority to regulate large edge providers such as Google, Yahoo and Netflix. However, such time has not yet arrived.

Conclusion

The Internet and IP technology, which were not mentioned in the 1996 Act, have quickly become not only a dominant force in the telecommunications industry, but also an increasingly critical resource enabling Americans to participate in the economic, political, cultural and social life of the nation. Along the way, dotcoms that were expected to become world beaters have plunged to earth and disappeared, while others of which little was expected have survived and prospered. The one persistent truth, to date, is that most expert predictions regarding the future of the IP world have been wrong.

In addition to emphasizing the need for humility, this recent history provides a persuasive advertisement for proceeding with caution and in limited steps until the current technological revolution slows and the future of the Internet and the rest of the telecommunications industry become more discernible. The Committee stands in an excellent position to monitor and address both continuing technical and industry developments and the FCC's regulatory handling of them. WTA urges the Committee to focus more at present upon specific industry sectors or geographic areas where the FCC's competition policies are either working or producing unforeseen adverse consequences rather than trying to develop new comprehensive competition definitions and policies in a rapidly changing industry. Likewise, the Committee should review and evaluate the impacts of specific FCC rules and decisions rather than looking to modify the FCC's basic mission at this time.



June 13, 2014

Committee on Energy and Commerce
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, DC 20515

RE: Response to #CommActUpdate White Paper No. 3
Competition Policy and the Role of the Federal Communications Commission

Comments of xG Technology, Inc.

xG Technology, Inc. (NASDAQ: XGTI) is pleased to have this opportunity to submit its comments in response to the Congressional White Paper on Competition Policy and the Role of the Federal Communications Commission ("White Paper").

xG is the developer of a broad portfolio of intellectual property that makes wireless networks more intelligent, accessible, affordable and reliable. The company is the leading developer and manufacturer of cognitive radio technology products that enable spectrum sharing. xG's technology can solve the crisis facing the wireless industry caused by data-intensive devices and applications that are straining network capacity.

Cognitive radio networks, as developed by xG, represent an innovative approach in which radios are designed with an unprecedented level of intelligence and agility. Cognitive radios facilitate spectrum sharing because they are able to monitor, sense and detect the conditions of their operating environment and dynamically reconfigure their own characteristics to best match those conditions, thereby mitigating interference among users.

With regard to the specific questions presented in the White Paper, xG respectfully submits the following:

**1. How should Congress define competition in the modern communications marketplace?
How can we ensure that this definition is flexible enough to accommodate this rapidly
changing industry?**

Modern communications include everything from wireless communications, including Wi-Fi, cellular, satellites, cable, streaming, and lasers to plain old telephone service (POTS). Consumer choice is so broad today that strict regulation by the Federal Communications



Commission (FCC) is no longer needed to the extent it was when the FCC was created and given its mandate by the Communications Act of 1934.

With so many technologies available to accomplish similar communication objectives, it is the marketplace that should determine which of them survives, not legislation or regulatory decree. When Congress or the FCC mandates the survivor, none of the new or improved techniques that may accomplish the job more efficiently can be used until the mandate is changed, resulting in considerable waste and lost time. Instead, the role of regulators should be to state the objective, *e.g.*, all First Responders should have the ability to communicate with each other, and then let the marketplace determine how best to achieve the objective.

The rationale for spectrum auctions was that those who value the spectrum the most would pay the highest price. While this concept may benefit the U.S. Treasury, it has resulted in the undeniable fact that the wealthiest companies, *e.g.*, AT&T and Verizon, have acquired the vast majority of the most valuable spectrum, to the detriment of small companies, including those in rural areas of the country. The effect has been to stifle, rather than encourage, competition. Going forward, the better approach would be to limit the auctionable spectrum and set aside large portions of spectrum for shared, unlicensed use. This would allow any entity, large or small, to enter the marketplace and provide service as technologies or conditions dictate. The selling of spectrum which seemed like a good idea at the time has, because of technology advances, closed off those frequencies from any competition. Shared-use spectrum should be a major focus of the Commission in light of the spectrum shortage crisis. Requiring cognitive radio techniques on shared spectrum would also facilitate sharing of federal government frequencies by commercial users where feasible.

2. What principles should form the basis of competition policy in the oversight of the modern communications ecosystem?

The basic principle to define competition should be consumer choice. And as long as there are at least three choices available to consumers, that should be enough. If there are issues such as concerns about price fixing, or other disputes, those concerns should be handled by the Justice Department.

3. How should intermodal competition factor into an analysis of competition in the communications market?

No doubt, intermodal competition has lessened the need for regulation in the communications marketplace. Consumers have so many choices today that when you look at competition, it should largely rely on determining if consumers have sufficient choice. There are



now multitude ways of accessing the Internet. Voice calls are made over the Internet at either no cost or very inexpensively. In fact, one cellular company allows smartphones, with the capability, to make calls and send and receive data over the internet using Wi-Fi, instead of using congested frequencies; and in many parts of the country, cable provides additional choices. The fixed phone and cellular networks are beginning to switch their calls to Voice over Internet Protocol (VoIP) in order to gain the efficiencies over the switched telephone network.

4. Some have suggested that the FCC be transitioned to an enforcement agency, along the lines of the operation of the Federal Trade Commission, rather than use broad rulemaking authority to set rules a priori. What role should the FCC play in competition policy?

The FCC should be allowed to continue to do the things it does best – frequency allocations and assignments, licensing of spectrum, regulating RF interference, setting standards for RF equipment, and enforcing its regulations. It would be well to put the FCC into a role that will result in reduced litigation before the courts. The FCC should thus be more like the FTC and should rely more on the Justice Department for those matters that are capable of being handled by that agency.

5. What, if any, are the implications of ongoing intermodal competition at the service level on the Commission's authority? Should the scope of the Commission's jurisdiction be changed as a result?

As indicated above, intermodal competition significantly reduces the need for the Commission to regulate communications at the service level. Nevertheless, the Commission appears to operate as it did in the days when there were monopoly conditions in the marketplace. When one looks at the critical issues that provide consumer choice, intermodal means of "doing the same thing" must be considered. For example, one can access the Internet via at least five methods; and one can place voice calls in that many ways. Accordingly, the Commission should streamline its role in regulating communications networks, and ensure that its personnel are trained to understand the technical, business and consumer impact aspects of new technologies.

6. What, if any, are the implications of ongoing intermodal competition on the role of the FCC in spectrum policy?

There is a significant amount of redundancy between the FCC and the Justice Department when it comes to competition. The Justice Department has a full division devoted to addressing competition and its implications -- and it is not unusual for the Justice Department to have the deciding say in this process. The Communications Act should move away from this redundancy



by focusing the FCC on applying its technical expertise to the regulation of telecommunications, while allowing DOJ to apply its expertise in the regulation of wireless competition. As noted above, going forward, the FCC should focus more on shared use of the RF spectrum and methodologies of avoiding interference among users of shared spectrum. This can render moot much of the need for regulation of competition by the FCC in wireless matters.

7. What, if any, are the implications of ongoing intermodal competition at the service level on the FCC's role in mergers analysis and approval?

The best place for deciding winners and losers is in the marketplace; and as long as there are sufficient choices, there is reduced need for regulation of the marketplace. Of course, there are numbering, equipment certification and other technical matters that must still be regulated. And there may be certain instances where public policy or other considerations require certain focused regulation, such as the broadcast industry which has exclusively assigned frequencies.

8. Competition at the network level has been a focus of FCC regulation in the past. As networks are increasingly substitutes for one another, competition between services has become even more important. Following the Verizon decision, the reach of the Commission to regulate "edge providers" on the Internet is the subject of some disagreement. How should we define competition among edge providers? What role, if any, should the Commission have to regulate edge providers – providers of services that are network agnostic?

FCC regulation at the network level can hinder the marketplace. The FCC should not be put into the position of trying to pick winners and losers in today's regulatory environment. That is the root cause of the issues that result in lawsuits and, not infrequently, forces the courts to overrule the FCC for overreaching in its regulatory process.

9. What regulatory construct would best address the changing face of competition in the modern communications ecosystem and remain flexible to address future change?

As discussed above, the FCC should reduce its role in the regulation of competition, and focus more on maintaining oversight of technical and other matters more clearly in the realm of its expertise. Elimination of redundancy with the Justice Department should also be encouraged.



10. Given the rapid change in the competitive market for communications networks and services, should the Communications Act require periodic reauthorization by Congress to provide opportunity to reevaluate the effectiveness of and necessity for its provisions?

It would be wise for the Communications Act to employ sunset dates in many regards so that Congress could decide periodically whether, in a highly competitive marketplace, certain regulations continue to be needed. It would be better to have periodic reauthorization than for Congress to have to make changes on a piecemeal basis. Regulations would remain in place following the sunset date only if Congress had not acted in advance to make changes.

Respectfully submitted,

xG Technology, Inc.



George Schmitt
Chairman

June 13, 2014

The Honorable Fred Upton
Chairman
Committee on Energy and Commerce
House of Representatives
Washington, DC 20515

The Honorable Henry Waxman
Ranking Member
Committee on Energy and Commerce
House of Representatives
Washington, DC 20515

The Honorable Greg Walden
Chairman
Communications and Technology Subcommittee
Committee on Energy and Commerce
House of Representatives
Washington, DC 20515

The Honorable Anna Eshoo
Ranking Member
Communications and Technology Subcommittee
Committee on Energy and Commerce
House of Representatives
Washington, DC 20515

Dear Chairmen Upton and Walden, Ranking Members Waxman and Eshoo:

XO Communications (XO) appreciates the opportunity to provide further input to the Committee as it contemplates whether changes to the Communications Act of 1934 (“Act”) as amended are warranted. In seeking to establish competition as the touchstone for our nation’s communications policymaking, the Committee, of course, is not writing on a blank slate. A century ago, the federal antitrust authorities first addressed concerns about anticompetitive conduct in the industry (by AT&T) and ordered the first in a string of structural remedies. Since then, there have been many actions taken by Congress, the antitrust authorities, and by the Federal Communications Commission (“FCC”) to ensure consumers get the benefits of competition. Most recently, with the passage of the Telecommunications Act of 1996 (“1996 Act”), Congress adopted a framework to drive local competition – a framework that has proven successful. It is within this context of a century of policy and law that the Committee is now seeking to update the Act.

XO is a creature of the 1996 Act’s pro-competition policies. For nearly two decades, XO has been a leading innovator in providing telecommunications and information services exclusively to business customers. Just in the last two years, XO became the first carrier to provide 100 Gigabit backhaul speeds coast to coast, and XO also accelerated the speeds it provides to customers using copper connections to 100 Megabits per second. Most recently, XO announced a half-billion dollar initiative to extend the reach of its network to more buildings and add to network capacity where needs demand. None of this would have been possible without the pro-competitive framework that exists today, and none of this would have been possible without today’s regulatory certainty – as access to capital for network investment is non-existent during Congressional and regulatory tumult.

XO’s story is not atypical, and, as a result, consumers throughout the country greatly benefited from the 1996 Act. For instance, because of the 1996 Act, states could not erect barriers to providers who wanted to enter the local telephone business. The 1996 Act further permitted anyone in America to fire their carrier and take their phone number – and their business – elsewhere. The 1996 Act also required dialing parity, which prior to its enactment meant that Americans would have to dial an 11-digit number to use an alternative long-distance carrier. In fact, the 1996 Act’s provisions are responsible for turning long-distance service, which not that long ago was an expensive offering, into a

commodity business. Finally, one cannot overlook the benefits of a robust interconnection policy that ensures any phone can call any other phone, regardless of what network it is connected to, or a network access policy that afforded American consumers and businesses a choice of providers almost immediately after the 1996 Act became law. By any objective measure, the 1996 Act is a great example of a successful, economically significant, bipartisan law. It has lived up to its title as “An Act to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies.”

As noted in XO’s January response to the Committee’s first White Paper, today we have a time-tested competition policy that has a century of reliable and predictable application to markets. That policy is to first open and facilitate entry, then, for each market, deregulate where competition is demonstrated to exist. With XO being a facilities-based provider of communications services to businesses, its focus on business-grade telecommunications makes XO uniquely positioned to comment on the business market and the considerable ways in which it differs from the residential market for competition purposes. The consumers in both markets are vastly different. For example, residential subscribers often choose from a pre-set group of services with little customization, while business consumers have a great deal of specialized needs. But besides these differences, there are also differences in who has facilities serving businesses and residences. Where facilities-based alternatives are limited, the presence of a functioning wholesale market for network access is all the more imperative so consumers have the choice of an alternative service provider and are not captive to the carrier that controls the connection.

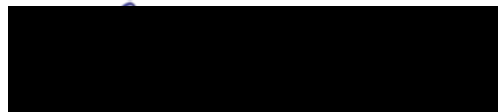
This discrepancy between the fundamental structure of the residential and business markets underscores the importance of proper assessment of the competitive factors. These market distinctions have been noted in the FCC’s Qwest Forbearance Order of June 22, 2010. That order correctly evaluated the many different product markets in the relevant geographic market. Each warrants competitive examination based on empirical data and appropriate actions then flow from that analysis. We thus have an economically sound (and court-sanctioned) regime that looks at the relevant product and geographic markets, analyzes whether sufficient competition exists to maintain competitive prices and the provision of innovative services, and finally, where competition is insufficient, adopts and implements appropriate market-opening rules. In areas where markets are not fully functional, policymakers have used an array of tools to open them so that the benefits of competition can flow and deregulation can eventually occur. This ranges from easing entry (and exit), providing wholesale access to bottleneck services and facilities and access to infrastructure essential to build networks at rates that foster competition, and ensuring cost-based interconnection. These tools need to be preserved, especially when market power exists. This time-tested approach should continue.

The FCC is uniquely situated with its jurisdiction to effect appropriate, light touch regulatory oversight. The presence of Section 10 of the Act is a powerful tool that can be used by regulated entities that seek forbearance in specific markets from their legal or regulatory obligations, and the Commission has sua sponte forbearance authority to swiftly address other legal or regulatory matters that could impede competition. The FCC is particularly effective in overseeing the telecommunications industry as many disputes or allegations of market power abuse are often of an asymmetrical nature – between carriers of differing sizes. Clear Commission authority provides easy to understand rules of the road and ensures a level playing field. If Congress were to alter the FCC’s role to make it more like the Federal Trade Commission (FTC) (or just give those duties to the FTC), smaller carriers and new entrants would

undoubtedly be at a significant disadvantage and may not even have the requisite resources to seek relief. Consequently, for example, access and interconnection disputes could result in calls not reaching their destination, or other real-time harms that could ground business and industry to a halt – not to mention the risks to emergency communications and first responders. Making sure the network works is properly in the jurisdiction of the FCC and should remain.

The competitive benefits that have resulted from the passage of the 1996 Act have been substantial. In fact, innovations and advancements that some policymakers or other stakeholders point to as a reason to jettison the pro-competitive tenets of the Act came about as a direct result of the Act. It is difficult to examine them in a vacuum, but we have history as a guide. Rather than return to the days before competition took hold in the marketplace, when innovation moved at a glacial pace – if at all, XO urges policymakers to embrace the Act’s pro-competitive approach and its record of success. If not, Congress will place billions in investment, thousands of jobs and robust economic growth at risk. In sum, Congress should take a measured approach to modifying the Act and understand that individual provisions of the Act are interconnected and interdependent.

Sincerely,



Patrick Thompson
Director, Legislative Affairs
XO Communications



Center for Technology, Innovation and Competition



<http://www.law.upenn.edu/academics/institutes/ctic/>

University of Pennsylvania Law School
3400 Chestnut Street
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June 13, 2014

Committee on Energy and Commerce
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, D.C. 20515

Re: Competition Policy and the Role of the Federal Communications Commission

Dear Chairmen Upton and Walden:

On June 4, 2014, I participated in an expert panel in Washington to present my new paper, "[U.S. vs. European Broadband Deployment: What Do the Data Say?](#)" A copy of the paper is included below in response to the Committee's most recent white paper on the Communications Act Update. An [executive summary](#) and [microsite](#) are also available.

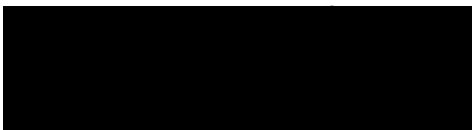
My paper uses NTIA, FCC, and EU data to illuminate numerous findings. On the whole, the U.S. has led Europe in many broadband metrics, contrary to some reports that Europe is ahead of the U.S. in terms of broadband deployment. For example, the paper finds that a far greater percentage of U.S. households received 25 Mbps than in Europe.

Regression analysis indicates that the U.S. approach of promoting facilities-based competition has proven more effective in promoting 25 Mbps coverage than the European approach of service-based competition and unbundling. The paper finds that the U.S. invested more than twice as much per household (\$562) than did Europe (\$244). The U.S. also exceeds Europe in terms of rural service, overall usage, and entry-level pricing.

The study also includes case studies of eight European countries (Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden, and the United Kingdom). These case studies confirm that facilities-based competition has served as the primary driver of upgrading broadband networks. In addition, the paper finds that countries which emphasized different technologies or used a balanced approach consistently achieved higher 25 Mbps coverage rates, indicating the need for a technology neutral approach to competition policy.

I would encourage the Committee to keep these comparisons in mind as it considers updates to the Communications Act. Thank you for this opportunity to give feedback in the laudable process to update the Communications Act. I look forward to engaging further on this issue.

Sincerely,



John H. Chestnut Professor of Law
Professor of Communication
Professor of Computer and Information Science
Founding Director, Center for Technology, Innovation, and Competition

Enclosure

U.S. vs. European Broadband Deployment: What Do the Data Say?

Christopher S. Yoo

John H. Chestnut Professor of Law, Communication,
and Computer and Information Science at the
University of Pennsylvania

Founding Director of the Center for Technology,
Innovation and Competition



Center for Technology, Innovation and Competition

U.S. vs. European Broadband Deployment: What Do the Data Say?

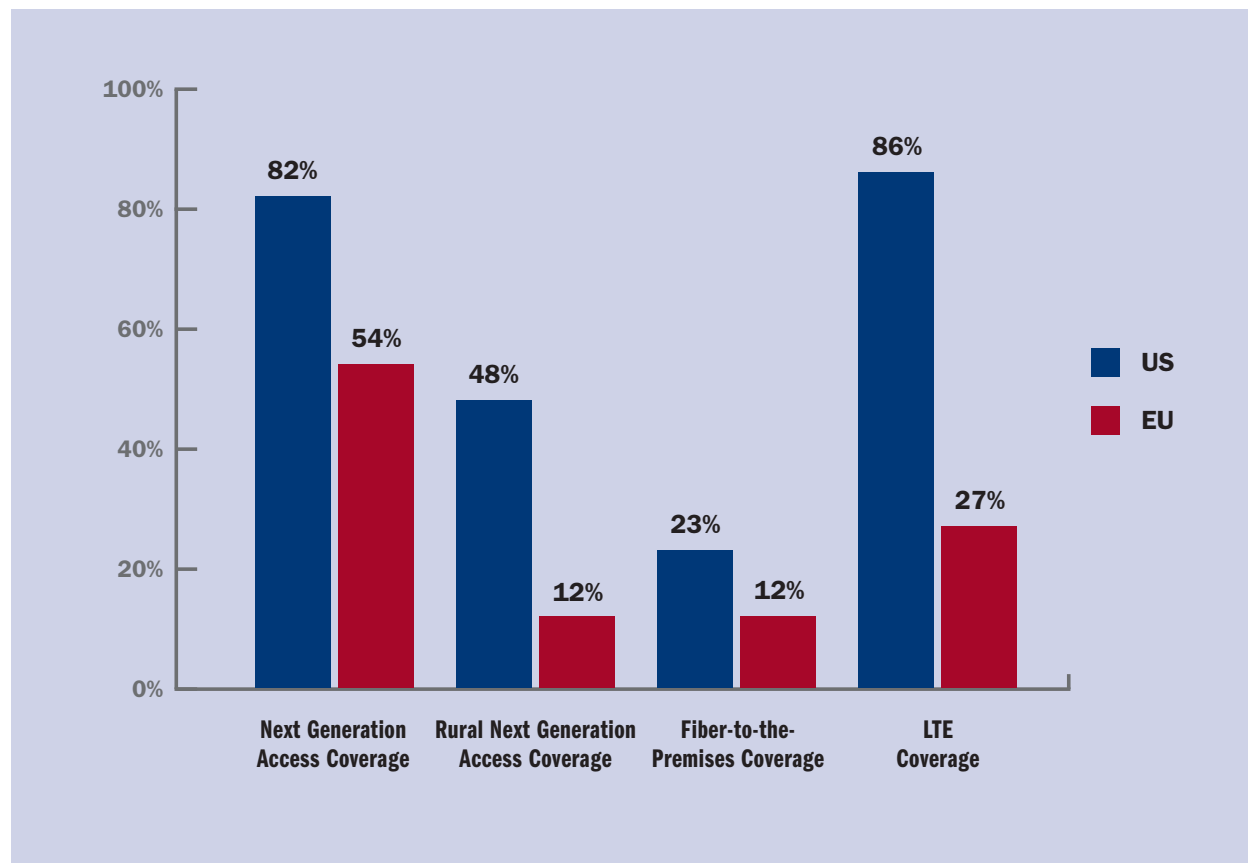
Christopher S. Yoo
June 2014

EXECUTIVE SUMMARY

As the Internet becomes more important to our everyday lives, commentators debate over the best policies and models to drive even more widespread adoption and deployment of broadband technologies. Some claim the European model of service-based competition, induced by stiff telephone-style regulation, outperforms the facilities-based competition practiced in the U.S. in promoting broadband. Data analyzed for this report reveals, however, that the U.S. led in many broadband metrics in 2011 and 2012.

- **High-Speed Access:** A far greater percentage of U.S. households had access to Next Generation Networks (NGA) (25 Mbps) than in Europe. This was true whether one considered coverage for the entire nation (82% vs. 54%) or restricted the analysis to rural areas (48% vs. 12%), suggesting that the U.S. approach proved more effective than the European approach at narrowing the digital divide.
- **Fiber and LTE Deployment:** Turning to specific technologies, the data indicate that the U.S. had better coverage for fiber-to-the-premises (FTTP) (23% vs. 12%) and for the fourth-generation wireless technology known as Long-Term Evolution (4G LTE) (86% vs. 27%). Furthermore, empirical analysis undercuts claims that the provision of high-speed Internet depended exclusively on fiber. In short, FTTP remained a minor contributor to NGA coverage, and those countries that emphasized fiber were the bottom broadband performers among the eight European countries studied.
- **Regulatory Policies and Competition Models:** Disparities between European and U.S. broadband networks stemmed from differing regulatory approaches. Europe has relied on regulations that treat broadband as a public utility and focus on promoting service-based competition, in which new entrants lease incumbents' facilities at wholesale cost (also known as unbundling). The U.S. has generally left buildout, maintenance, and modernization of Internet infrastructure to private companies and focused on promoting facilities-based competition, in which new entrants are expected to construct their own networks. Regression analysis indicates that the U.S. approach has proven more effective in promoting NGA coverage than the European approach.
- **Investment:** The difference in regulation and competition models influenced the amount of broadband investment in the U.S. and Europe. In Europe, where it was cheaper to buy wholesale services from an incumbent provider, there was little incentive to invest in new technology or networks. In the U.S., however, providers had to build their own networks in order to bring broadband services to customers. Data analysis indicates that as of the end of 2012, the U.S. approach promoted broadband investment, while the European approach had the opposite effect (\$562 of broadband investment per household in the U.S. vs. \$244 per household in Europe).
- **Download Speeds:** U.S. download speeds during peak times (weekday evenings) averaged 15 Mbps, which was below the European average of 19 Mbps. There was also a disparity between the speeds advertised and delivered by broadband providers in the U.S. and Europe. During peak hours, U.S. actual download speeds were 96% of what was advertised, compared to Europe where consumers received only 74% of advertised download speeds. The U.S. also fared better in terms of latency and packet loss.

Coverage in the U.S. and Europe, 2012



- **Price:** The European pricing study reveals that U.S. broadband was cheaper than European broadband for all speed tiers below 12 Mbps. U.S. broadband was more expensive for higher speed tiers, although the higher cost was justified in no small part by the fact that U.S. Internet users on average consumed 50% more bandwidth than their European counterparts.

Data analyzed for the study resolves the question whether the U.S. is running behind Europe in the broadband race or vice versa. The answer is clear and definitive: As of 2012, the U.S. was far ahead of

Europe in terms of the availability of NGA. The U.S. advantage was even starker in terms of rural NGA coverage and with respect to key technologies such as FTTP and LTE. The empirical evidence thus confirms that the United States is faring better than Europe in the broadband race and provides a strong endorsement of the regulatory approach taken so far by the U.S. It also suggests that broadband coverage is best promoted by a balanced approach that does not focus exclusively on any one technology.

Case studies of eight European countries (Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden, and the United Kingdom) confirm that facilities-based competition has served as the primary driver of investments in upgrading broadband networks. Moreover, the countries that emphasized FTTP had the lowest NGA coverage rates in this study and ranked among the lowest NGA coverage rates in the European Union. In fact, two countries often mentioned as leaders in broadband deployment (Sweden and France) end up being rather disappointing both in terms of national NGA coverage and rural NGA coverage.

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Data analysis indicates that the U.S. approach promoted broadband investment, while the European approach had the opposite effect.

.....



Comparison between U.S., EU and Case Study Countries, 2012

	Total NGA	Rural NGA	Investment per HH	Bandwidth per User	Percentage Rural HHs
U.S.	82%	48%	\$562	27	19%
Europe	54%	12%	\$244	18	15%
Sweden	57%	6%	\$280	n/a	17%
France	24%	1%	\$326	12	18%
Italy	14%	0%	\$291	12	13%
Denmark	73%	3%	\$457	n/a	17%
Spain	64%	13%	\$255	13	18%
Netherlands	98%	85%	\$450	n/a	8%
UK	70%	18%	\$215	31	9%
Germany	66%	26%	\$197	14	11%

U.S. vs. European Broadband Deployment: What Do the Data Say?

Christopher S. Yoo*

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* John H. Chestnut Professor of Law, Communication, and Computer & Information Science and Founding Director, Center for Technology, Innovation and Competition, University of Pennsylvania. The author would like to thank Erik Bohlin, Thomas Fetzer, Anders Henten, Jorge Pérez Martínez, Andrea Renda, and Nico van Eijk for their help in organizing the international portions of this study and Beril Boz, Henk Doorsenspleet, Zoraida Frias, Chatchai Kongaut, Giacomo Luchetta, Gregory Manas, Maria Massaro, Felice Simonelli, Bumpei Sugano, Kimberly Wexler, and Daniel Widmann for their expert research assistance. He would also like to thank participants at the Fourth Workshop on Internet Economics cosponsored by CAIDA and MIT at the University of California at San Diego and the Workshop on Current Issues in Internet Law in Europe and the U.S. cosponsored by the University of Pennsylvania's Center for Technology, and Innovation, Mannheim Centre for Competition and Innovation (MaCCI) of the University of Mannheim, and the Centre for European Economic Research (ZEW) in Mannheim, Germany, for their comments on earlier drafts. He would also like to thank Broadband for America for its financial support for this project.

“

Survey after survey shows U.S. broadband quality, speed and adoption rates falling dangerously behind that of countries in Asia and Europe.

— Free Press

“

[W]hile digital technology and content has improved, and countries around the world, from the US to Asia, are starting to reap the benefits out of it, Europe is falling behind.

— Neelie Kroes (2013b)

1. INTRODUCTION

Articles periodically appear in the U.S. media raising the concern that the U.S. is falling behind Europe in the broadband race. These stories typically characterize U.S. high-speed broadband as widely unavailable, expensive, and slow. The proposed solution is to reform U.S. broadband policy so that it is more like Europe's (see, e.g., *New York Times* 2013, 2014b; *NPR* 2014; *USA Today* 2014).

Media reports and speeches by policymakers on the other side of the Atlantic tell a very different story. The concern there is that Europe is falling behind the United States and that the low levels of investment in broadband infrastructure indicate that Europe should consider adopting a more U.S.-style regulatory approach (see, e.g., Kroes 2012a, 2012b, 2013a, 2013b, 2013c; *Süddeutsche Zeitung* 2013 (quoting Angela Merkel)).

The contradictory nature of these statements invites a closer examination of the true state of affairs with respect to broadband in different parts of the world (although this study focuses on Europe and defers consideration of Asian broadband until another study planned for later this year). The most frequently cited basis for comparison is the data about broadband subscriptions collected by the Organisation for Economic Co-operation and Development (2013). However, these data are problematic for several well-recognized reasons. First, the OECD defines broadband as any service capable of delivering 256 kbps. As a result, the data provide information about a service tier that is generally regarded as obsolete. Second, broadband subscribership represents a rather murky indicator of broadband availability and investment. Studies have consistently shown that the primary reasons that people do not subscribe to broadband are a lack of interest, lack of a computer, difficulties in using the Internet, lack of computer skills, and age rather than nonavailability or high prices (EC 2013b, 13; Ofcom 2013a, 368; Pew Research Center Internet Project 2013).

Broadband penetration levels thus reflect a broad range of considerations unrelated to coverage and infrastructure investment. What is needed is a direct measure of broadband availability. Although the OECD tracks this information, the data currently available are rather old, having not been updated since 2009, and again track the obsolete 256 kbps standard.

Fortunately, both the European Commission (EC) and the U.S. government have recently commissioned studies providing detailed information about the extent of broadband coverage as of the end of 2011 and 2012 (NTIA and FCC 2012a, 2013a; EC 2012a, 2013a). These studies report coverage levels for a wide range of speed tiers and technologies in both urban and rural areas. The European mapping study focuses on Next Generation Access (NGA), which it defines to be service providing download speeds of at least 30 Mbps, a close analysis reveals that the study actually reports data for 25 Mbps service (EC 2013a, 6).

These data reveal that concerns that the U.S. is losing the broadband race are misplaced. As an initial matter, a far greater percentage of U.S. households have access to NGA than in Europe. Interestingly, this is true whether one considers coverage for the entire nation or one restricts the analysis only to rural areas, suggesting that the U.S. approach is more effective than the European approach at narrowing the digital divide. Turning to specific technologies, the data also indicate that the U.S. also has better coverage for cutting-edge technologies, including fiber-to-the-premises (FTTP) and for the fourth-generation wireless technology known as Long-Term Evolution (4G LTE).

.....

These data reveal that concerns that the U.S. is losing the broadband rates are misplaced. ... [A] far greater percentage of U.S. households have access to NGA than in Europe.

.....

The mapping data also provide insight into the long-standing debate between the regulatory philosophies underlying U.S. and European broadband policy. European broadband policy has focused on promoting service-based competition, in which new entrants lease the incumbents' facilities at wholesale cost, while U.S. broadband policy has focused on promoting facilities-based competition, in which new entrants are expected to construct their own networks. The mapping data are sufficiently detailed to permit regression analysis to determine which approach is better at promoting high-speed broadband coverage. The regressions indicate that the U.S. approach is promoting broadband investment, while the European approach is having the opposite effect. More specifically, service-based com-

petition has a statistically significant negative impact on NGA coverage, while facilities-based competition has a statistically significant positive effect on NGA coverage. The fact that these regressions yield such strong results despite being based on a relatively small number of observations attests to the strength of these conclusions.

These results have clear implications for public policy. For example, they shed light in to how Europe can meet its Digital Agenda goal of 100% NGA coverage by 2020. In addition, as noted above, European policymakers have begun an active debate over whether they should shift their emphasis away from their traditional focus on promoting service-based competition in favor of an approach focused on increasing incentives to invest in infrastructure. In the U.S., comparisons with the European experience are sometimes invoked as support for proposals to reclassify the Internet to bring it within the regime of common carriage or public utility regulation that has governed traditional telephone service (FCC 2014). The experience under the different approaches to regulation will also provide insights into how to manage the IP transition as well as how best to update the U.S. communications statutes.

These mapping studies have been supplemented by other studies conducted or commissioned by the EC or the FCC that examine other key information, such as broadband investment, pricing, and download speeds (EC 2012b, 2013d, 2014c, FCC 2012b). The European pricing study reveals that U.S. broadband is cheaper in the U.S. than European broadband for all speed tiers up to 12 Mbps. U.S. broadband is more expensive for higher speed tiers, although the higher cost is justified in no small part by the fact that the average U.S. household consumes 57% more bandwidth than its European counterpart.

The study supplements the European-level analysis with case studies of eight leading European countries. These studies reveal that three countries that did not face vigorous competition from cable and emphasized FTTP over DSL (Sweden, France, and Italy) achieved the lowest NGA coverage rates in this study, ranking near the very bottom of the EU, and were particularly weak in rural NGA coverage. The only country of these countries to achieve significant fiber penetration (Sweden) did so through government subsidies that led to public ownership of 40% to 50% of the fiber. Sweden still ranked only 20th of 28 EU states. The five countries with effective competition from cable all exceeded EU NGA coverage levels. Among the two countries that

The European pricing study reveals that U.S. broadband is cheaper in the U.S. than European broadband for all speed tiers up to 12 Mbps.

emphasized FTTP over DSL, Denmark's FTTP initiative (driven largely by energy companies) has stalled, while Spain's is increasing its deployments. Among countries emphasizing VDSL, FTTP coverage remains surprisingly modest in the Netherlands, notwithstanding the well-publicized fiber initiatives associated with Reggefiber and CIF. Germany and the UK have achieved respectable NGA coverage despite focusing on VDSL almost to the total exclusion of FTTP. These outcomes suggest that policymakers should not focus too narrowly on any one technology. Instead, they should take a flexible approach that takes into account existing deployments and the different economics underlying each technology.

2. THE EUROPEAN AND U.S. MAPPING STUDIES

2.1 Next Generation Access (NGA) Coverage

As noted above, for purposes of measuring broadband investment, coverage is the better way to measure outcomes than subscriptions. Fortunately, both the EC and the U.S. government have recently commissioned mapping studies that have generated high-quality data regarding broadband availability as of the end of 2011 and 2012. The European study encompasses the member states of the EU as well as Iceland, Norway, and Switzerland, although it reports data for the EU as well as for all of the study countries. The U.S. study reports both nationwide and state-level measures. Both studies also report broadband coverage for rural areas and break out each of these measures by all of the leading broadband technologies.

A comparison of the top-line statistics reveals the U.S. is far ahead of Europe in terms of total NGA coverage.

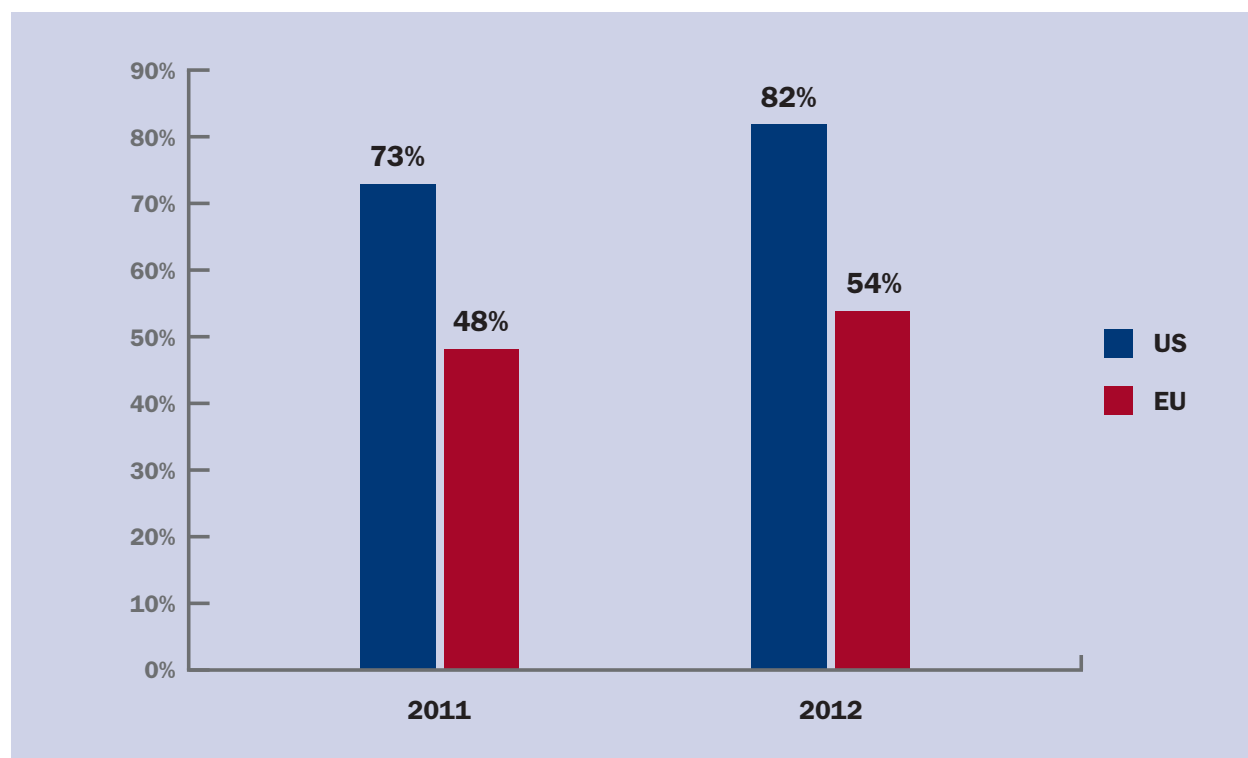
One major difference between the studies is the speed tiers analyzed. The U.S. study reports results for a wide variety of download speeds, including 768 kbps, 1.5 Mbps, 3 Mbps, 6 Mbps, 10 Mbps, 25 Mbps, 50 Mbps, and 100 Mbps. The European study reports results for only two speed tiers. The first is standard broadband, which the study defines as service providing download speeds of at least 144 kbps. The second is what the European Commission calls Next Generation Access (NGA). Although the EC's Digital Agenda defines NGA as 30 Mbps service, the mapping study defines NGA to include three technologies: VDSL, cable broadband provided through DOCSIS 3, and fiber-to-the-premises (FTTP), which includes both fiber-to-the-home (FTTH) and fiber-to-the-basement (FTTB). VDSL was in turn defined to include services capable of supporting download speeds of at least 25 Mbps (EC 2013a, 6). Although the European VDSL data is supposed to include only services capable of delivering download speeds of 25 Mbps, two countries (Belgium and the UK) included all VDSL services without limiting to those that met that threshold. Moreover, the European study

could also not confirm whether the data reported by six other countries (Austria, Poland, the Czech Republic, Greece, Italy, and Hungary) included only VDSL services that delivered 25 Mbps. As a result, the European data may overstate VDSL coverage slightly. The data for NGA coverage reported in the European mapping study is thus better regarded as representing coverage for 25 Mbps service, which matches up nicely with the data on 25 Mbps service provided in the U.S. study.

In addition, the U.S. mapping study was implemented by contracting separately with agencies in each state. Variations may thus exist in the way the U.S. data were collected. For example, the U.S. mapping data reports that VDSL provides 25 Mbps service to only 9.5% of U.S. households as of the end of 2012 even though AT&T reports providing its U-verse service to 24.5 million or 18% of U.S. households as of that date (AT&T 2012). Indeed, Ofcom places U.S. VDSL 30 Mbps coverage at 21% as of 2012 (Ofcom 2013b, 42). Despite such discrepancies, this study relies on the U.S. mapping data as reported to ensure consistency. Since that time, VDSL in the U.S. has continued to expand. In November 2012, AT&T announced its Project VIP, which included \$6 billion to extend its VDSL coverage from 24.5 million to 33 million homes, while deploying a technology known as IP DSLAMs to improve DSL service to an additional 24 million homes by the end of 2015. Together these technologies will provide 45–75 Mbps to 57 million homes.

Any comparisons based on the mapping studies must thus be made in terms of the tiers included in the European mapping study: standard broadband and NGA/25 Mbps. As it turns out, U.S. and European coverage for standard broadband are almost identical. Standard coverage is available in 99.5% of U.S. households and 99.4% of European households. Standard fixed coverage is available in 95.8% of U.S. households and 95.5% of European households. The fact that the European data reflect lower download speeds (144 kbps) than the U.S. data (768 kbps) indicates that if anything, these data understate the slight advantage enjoyed by the U.S.

Rural standard broadband coverage (98.4% for the U.S. vs. 96.1% for Europe) and rural standard fixed broadband (82.1% for the U.S. vs. 86.3% for Europe) are also quite similar, although as noted earlier the U.S. data reflect higher download speeds than the European data. Mobile broadband coverage at 3G speeds also fall within quite similar ranges, covering 98.5% of U.S. households and 96.3% of European

FIGURE 1:**NGA Coverage (25 Mbps) in the U.S. and Europe, 2011 and 2012**

Sources: EC (2013a); NTIA and FCC (2012a, 2013a).

households. The U.S. does enjoy an advantage with respect to rural 3G mobile broadband (94.9% for the U.S. vs. 82.1% for Europe).

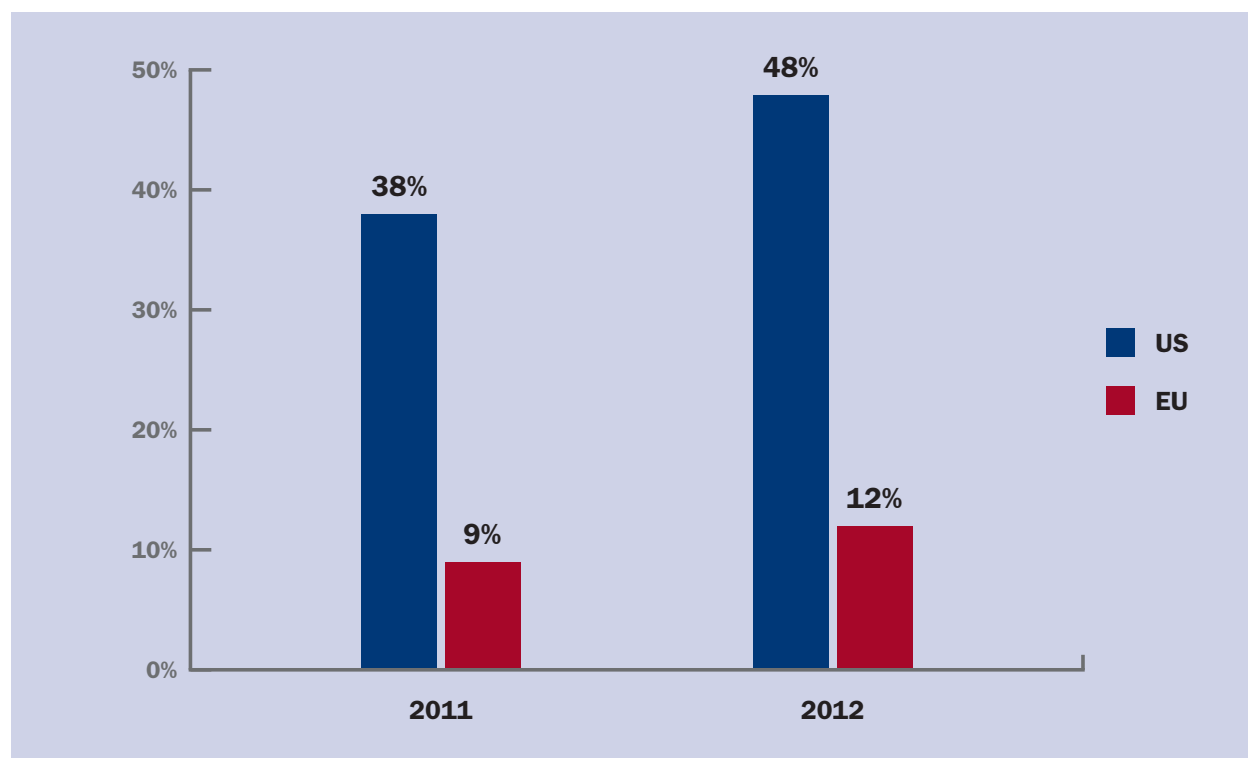
The data for 25 Mbps service reveal more significant differences. A comparison of the top-line statistics reveals the U.S. is far ahead of Europe in terms of total NGA coverage. Specifically, NGA service was available in 73% of U.S. households as of the end of 2011 and in 82% of U.S. households as of the end of 2012. By contrast, NGA service was available in only 48% of European households by the end of 2011 and in 54% of European households by the end of 2012.

A paired t-test indicates that the difference between U.S. and European NGA coverage is statistically significant at the 98% confidence level. Moreover, the U.S. advantage increased over time: In 2011, the difference between the U.S. and Europe NGA coverage was 25 percentage points, whereas by 2012 the difference had increased to 28 percentage points. Given the high levels of U.S. NGA penetration, it is unlikely that the U.S.

will be able to maintain this lead with respect to 25 Mbps service in the future, although the gap may persist at higher speed tiers. That said, it is clear that the U.S. enjoyed substantially greater national coverage of 25 Mbps service in 2011 and 2012.

2.2 Rural NGA Coverage

In addition to national data, both the U.S. and European studies include data for NGA coverage in rural areas. The U.S. and the European study applied slightly different definitions of rural areas. The European study viewed an area as rural if the population density was less than 100 people per square kilometer. The U.S. study viewed an area as rural if the population density was less than 500 people per square mile, which is the equivalent of 193 people per square kilometer. The U.S. definition includes areas that have slightly higher population density and thus is more forgiving.

FIGURE 2:**Rural NGA Coverage (25 Mbps) in the U.S. and Europe, 2011 and 2012**

Sources: EC (2013a); NTIA and FCC (2012b, 2013b).

In addition, the European mapping study identifies rural areas based on the European Kilometre Grid (EKG), which divides countries into squares one kilometer across and provides population density and basic land-use data for each square. The U.S. mapping study identifies rural areas in terms of census blocks (U.S. Census Bureau 1994).

With respect to rural NGA coverage, the gap between the U.S. and Europe was even wider than for total NGA coverage. As of the end of 2011, NGA service was available in 38% of U.S. rural households and 9% of European rural households. By the end of 2012, NGA service increased to 48% of U.S. rural households and 12% of European rural households. Given the wide disparity in these numbers, it is unlikely that it can be explained by the difference in definitions of what constitutes a rural area.

A paired t-test indicates that this difference is statistically significant at the 96% confidence level. Moreover, the U.S. advantage increased over time: In 2011, the

difference between the U.S. and Europe was 29 percentage points, whereas in 2012, the difference increased to 36 percentage points. As noted above, the fact that the U.S. study is based on a more generous definition of rural than the European study means that the actual difference is likely to be somewhat smaller, but it is unlikely that variation in methodology can explain all of the difference.

If the U.S. had been included in the European study, it would have ranked sixth in both NGA coverage and rural NGA coverage, behind only five countries. These countries are listed in Table 1, along with some additional information.

The rural household numbers are from the European mapping study. Population density and GDP per capita (adjusted for purchasing power parity) are from Eurostat, with GDP per capita indexed so that the EU average equals 100. Prices for 12–30 Mbps service are the median prices reported in the European study of broadband pricing as of February 2012 (EC 2012b).

TABLE 1:**Comparison of Countries with the Highest Total NGA Coverage, Rural NGA Coverage, 2012**

	Total NGA Rank	Rural NGA Rank	Pct. Rural HHs	Pop. Density (pop./km ²)	GDP per capita	Price 12–30 Mbps	Avg. speed Mbps
Malta	1	1	1%	1327	86	42 €	n/a
Netherlands	2	3	8%	497	128	30 €	8.6
Belgium	3	4	5%	367	120	34 €	6.7
Switzerland	4	5	15%	200	158	43 €	8.7
Luxembourg	5	2	13%	205	263	46 €	4.7
U.S.	6	6	19%	34	152	36 €	7.4

Sources: EC (2012b, 2013a); Eurostat (2014a, 2014c); NTIA and FCC (2013a, 2013b); Akamai (2013).

Average download speed is from Akamai, which, in light of the fact that SamKnows did not report download speeds for individual countries, represents the best source of country-level data on download speeds (Bauer, Clark, and Lehr 2011).

The countries that achieved higher NGA coverage than the U.S. are significantly more urban and compact than the U.S. In fact, the top three countries are the most urban countries in the European mapping study (Malta, Belgium, Netherlands), and the other two countries are in the top eleven in terms of urbanization and two of

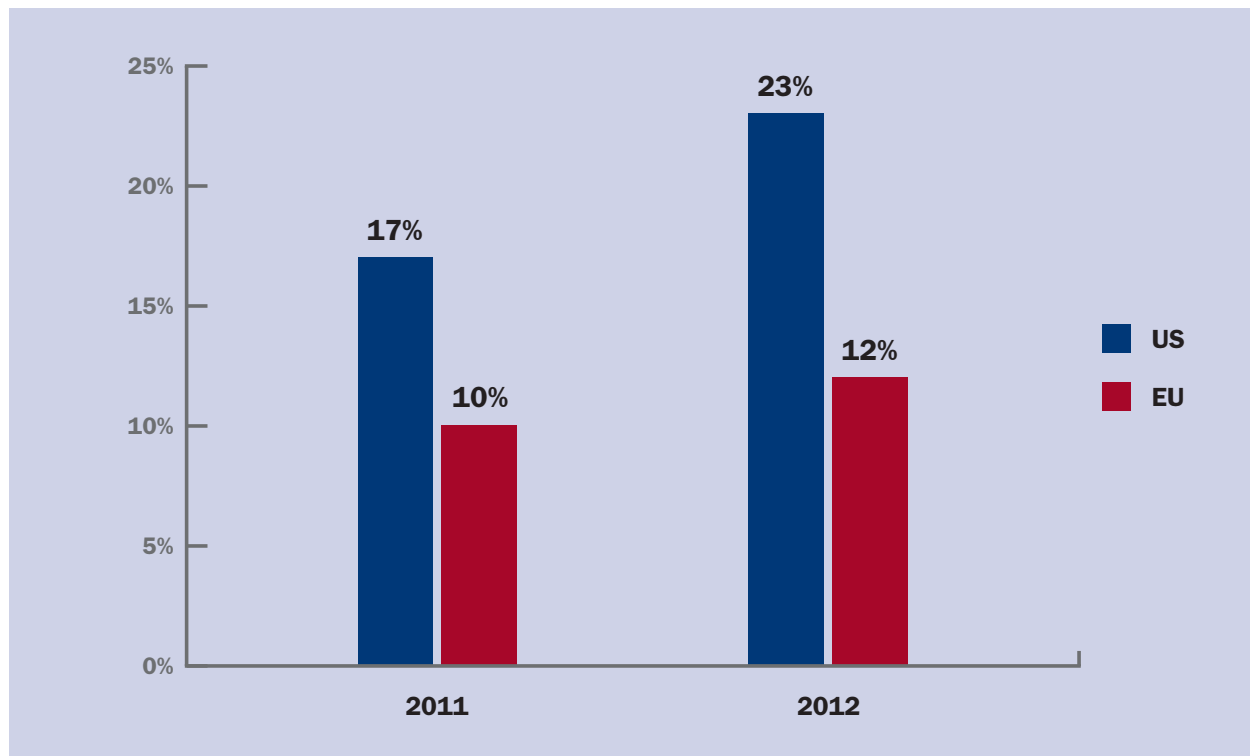
the top three countries in Europe in in terms of per capita GDP (Luxembourg, Switzerland). Furthermore, with the exception of Malta, all of the top NGA countries have per capita GDPs that far exceed the European average. In Malta, Switzerland, and Luxembourg, the price of 25 Mbps service is substantially higher than in the U.S., and in Luxembourg, the average download speed is substantially lower.

The U.S. would have thus stood close to the top of the list if it had been included in the European study of NGA coverage. The fact that the U.S. compares favor-

TABLE 2:**Percentage of Households covered by NGA, FTTP, DOCSIS 3, and VDSL and Rank for the Top Five NGA Countries, 2012**

	NGA	Rank	FTTP	Rank	DOCSIS 3	Rank	VDSL	Rank
Malta	99.9%	1	1%	27	99.9%	1	75%	3
Netherlands	98%	2	18%	16	98%	2	60%	4
Belgium	97%	3	0.3%	30	96%	3	85%	2
Switzerland	94%	4	17%	17	93%	4	53%	5
Luxembourg	94%	5	32%	12	61%	6	88%	1

Source: EC (2013a).

FIGURE 3:**FTTP Coverage in the U.S. and Europe, 2011 and 2012**

Sources: EC (2013a); NTIA and FCC (2012a, 2013a).

ably with countries that are much more urban and with significantly higher GDPs per capita is actually quite remarkable.

2.3 Fiber-to-the-Premises (FTTP)

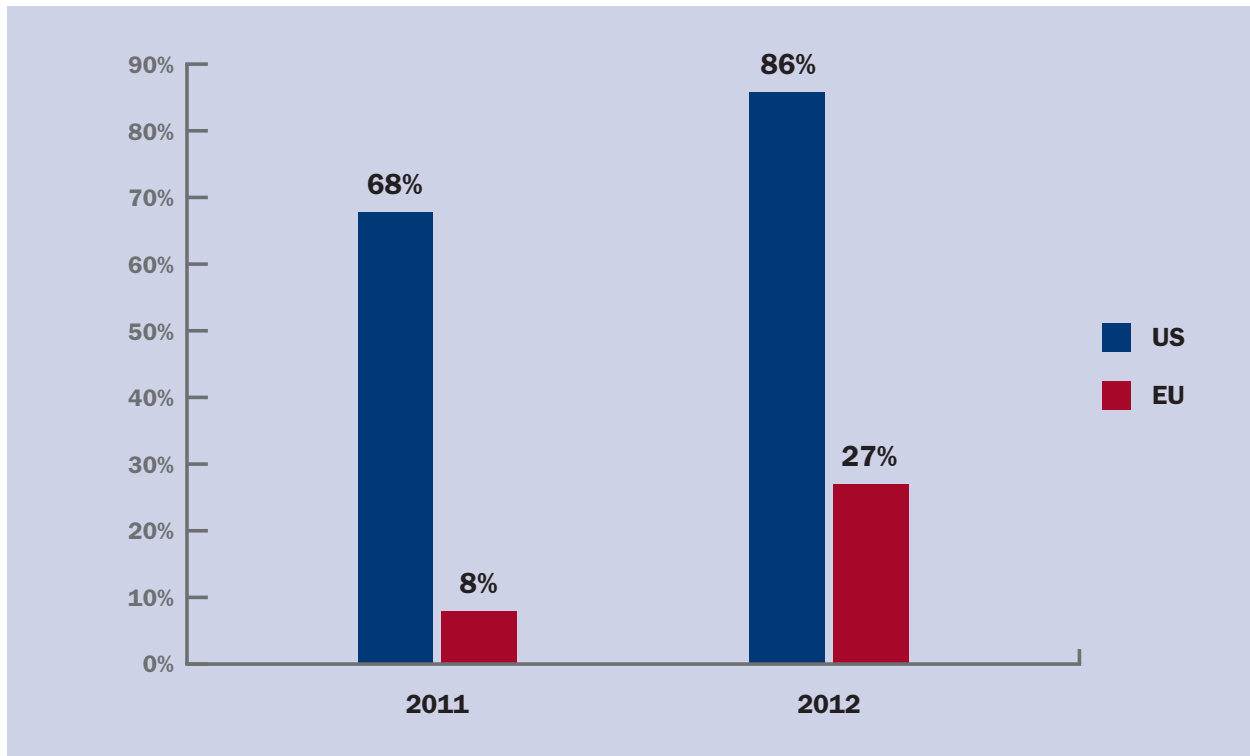
The mapping studies also provide insights into which technologies make the largest contribution to NGA coverage. Although many advocates regard FTTP as the primary platform for NGA, the data suggest otherwise. In Europe, DOCSIS 3 (39% as of 2012) and VDSL (25%) both contribute more to NGA coverage than does FTTP (12%). In terms of actual NGA subscriptions, the distribution skews even more heavily towards DOCSIS 3, with 57% of subscribers, followed by FTTP at 26%, and VDSL at 15% (EC 2013, 43, 52).

An analysis of the countries with the broadest NGA coverage reveals a similar pattern. Five European countries enjoyed NGA coverage that exceeded the

U.S. level of 82%. Interestingly, FTTP did not play a major role in any of these countries. In fact, two of them ranked near the bottom of FTTP coverage, and the other three fell somewhere in the middle of the pack. In contrast, all five of these countries ranked at the top for both DOCSIS 3.0 and VDSL coverage. The 2012 data thus do not support the critical role that many commentators assign to FTTP.

Even if one were to focus exclusively on FTTP coverage, the data clearly give the edge to the U.S. As of the end of 2011, FTTP service was available in 17% of U.S. households and 10% of European households. By the end of 2012, FTTP service increased to 23% of U.S. households and 12% of European households.

A paired *t*-test indicates that this difference is statistically significant at the 94% confidence level. If the U.S. were included in the European study, it would rank 12th, behind a number of Scandinavian countries, Eastern Europe countries, Luxembourg, and Portugal.

FIGURE 4:**LTE Coverage in the U.S. and Europe, 2011 and 2012**

Sources: EC (2013a); FCC (2013a).

2.4 LTE

The European study also collected data on LTE coverage as of the end of 2011 and 2012. The U.S. study did not collect LTE coverage data. However, LTE coverage data is available from the FCC's most recent Wireless Competition Report (2013a), which reported LTE coverage by population (instead of household) as of January 2012 and October 2012. Although these dates and measures do not correspond precisely with the data in the European mapping study, they are close enough to permit a useful comparison to the year-end 2011 and 2012 numbers reported for Europe.

With respect to LTE coverage, the data confirm the conventional wisdom that the U.S. is far ahead of Europe. As of the end of 2011, LTE covered 68% of the U.S. population and 8% of European households. By the end of 2012, LTE coverage increased to 86% of the U.S. population and 27% of European households.

A paired t-test indicates that this difference is statisti-

cally significant at the 99.8% confidence level. If the U.S. had been included in the European study, it would have ranked third in LTE coverage, trailing only Sweden and Portugal.

Because European coverage is measured based on households and U.S. coverage is based on population, this comparison should be approached with some caution. The wide disparity in these numbers makes it unlikely that this difference can be explained by the way coverage is defined. If anything, given the rapid buildout in the last two months of 2012, the fact that the U.S. data reflects coverage as of October 2012 instead of December 2012 means that if anything, the data understate the magnitude of the difference between U.S. and European LTE coverage rates.

* * *

A comparison of the U.S. and European mapping studies thus contradicts claims that the U.S. has fallen behind Europe in the broadband race. On the contrary,

the data convincingly show that it is Europe that has fallen behind the U.S. in terms of NGA, rural NGA, FTTp and LTE coverage. If the U.S. had been included in the European study on these measures, it would have ranked in the top six for every measure discussed above except for FTTp, and the only countries it would have trailed would have been compact, highly urbanized nations with high per capita GDPs and thus have a much easier time delivering high-speed broadband. The only exception is with respect to FTTp, and the data suggest that FTTp is the technology that contributes the least to NGA coverage.

2.5 Regression Analysis of Facilities-Based vs. Service-Based Competition

The European mapping studies also provide insight into one of the central debates in broadband policy. In the 1990s, as part of the Federal Communications Commission's *Computer Inquiries* and the Telecommunications Act of 1996, the U.S. developed the policy of permitting competitors to share incumbent providers' networks through local loop unbundling and wholesale access. The U.S. soon soured on this idea in part because the type of competition induced by infrastructure sharing is quite thin, with competitors being unable to innovate with respect to services and being limited to competing by squeezing their own margins, and in part because sharing can create disincentives to invest in infrastructure. As a result, the U.S. abandoned local loop unbundling in favor of a regulatory approach that focused on facilities-based competition.

European regulation, in contrast, has continued to emphasize the service-based competition by requiring carriers with significant market power to share their facilities through mechanisms such as local loop unbundling, shared access, and bitstream access. This regime was not designed only to permit competitors to share those network elements that exhibited natural monopoly characteristics and thus could not be replicated economically. It was also intended to permit new entrants to climb the "ladder of investment" by gradually replacing the network elements leased from the incumbent with their own infrastructure (Cave 2006). These access obligations apply generally to VDSL and FTTp services provided by incumbent telephone companies, but except for Denmark do not apply to cable broadband services.

As the International Telecommunications Union (2001)

has recognized, the arguments for and against local loop unbundling and wholesale access are theoretically ambiguous. An extensive literature has emerged evaluating the impact of access regulation on investments in traditional voice service and standard broadband service (see Cambini and Jiang 2009 for a survey). The empirical literature evaluating the impact of access obligations on investments in NGA is somewhat smaller and uniformly concludes that access regulation deters investments in NGA (Wallsten and Hausladen 2009; Briglauer, Ecker and Gugler 2012; Bacache, Bourreau and Gaudin 2013; Briglauer 2014).

The European mapping study provides fresh data collected that can be used to test these propositions. Although the number of observations is quite limited, the dataset reflects sufficient heterogeneity to support regression analysis of the impact of service-based and facilities-based competition on NGA coverage.

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The primary measure for service-based competition is the new entrants' market share of DSL lines, which are presumably served by sharing the incumbent's network (EC 2014b). The primary measure of facilities-based competition is broadband coverage by standard cable (EC 2013a). Standard cable broadband coverage would seem to be a good measure of the full scope of potential facilities-based competition to incumbent telephone companies because of the ease with which standard cable can be upgraded to DOCSIS 3. In any event the difference between standard cable broadband coverage and DOCSIS 3 coverage is not material: 94% of all standard cable broadband in Europe and 92% of all standard cable broadband in the U.S. had already been upgraded to DOCSIS 3 by the end of 2012. Although the results are reported in terms of standard cable, replacing standard cable coverage with DOCSIS 3 coverage does not materially change the results of the regressions.

The regressions also include controls for the percentage of the rural households as reported in the European mapping study. The percentage of rural households represents a better measure of urbanization (and thus costs of providing broadband) than population density. This is because the most important consideration from the standpoint of NGA coverage is what percentage of a country's population resides in nonrural areas. The fact that a country may have large tracts of unoccupied land lowers its population density, but does not make providing NGA service to the vast majority of the population any more difficult.

Take Sweden, for example. With 23 people per square kilometer, it has one of the lowest population densities in Europe, well below the EU average of 116 people per square kilometer and even below the U.S. average of 34 people per square kilometer. At the same time, 85% of the Swedish population is clustered in cities along the coast and another 3% live in small towns (PTS 2013), which are typically places with sufficient density to make NGA service feasible. This places Sweden in the middle of the pack in terms of urbanization (13th among 28 EU countries) despite having the second lowest population density in the EU (behind only Finland). Population density thus overstates how difficult it would be for Sweden to achieve strong levels of NGA coverage.

Conversely, other countries have relatively low levels of urbanization despite having relatively strong population densities. For example, only 68% of Hungarians live in nonrural areas, which places Hungary 26th of 28 EU countries in terms of urbanization, despite the fact that Hungary's population density ranks 13th out of 28 EU countries. Population density thus understates how difficult it would be for Hungary to achieve strong levels of NGA coverage. The statistic contained in the European mapping study reporting the proportion of households that are rural (i.e., residing in areas with population density less than 100 people per square kilometer) thus represents a better control than population density.

The regressions also include controls for year fixed effects and per capita GDP, adjusted for purchasing power parity and normalized so that the EU average equals 100 (Eurostat 2014). Because the errors are not randomly distributed, standard errors are clustered by country. To make sure that small countries do not exercise a disproportionate impact on the results, the regressions weight each country by population. One could also regard each country as an independent

policy experiment deserving of equal weight. If so, the regressions should not be weighted by population. Running the regression without weighting by population does not materially change the results.

The fact that a country may have large tracts of unoccupied land lowers its population density, but does not make providing NGA service to the entire population any more difficult.

To test the impact of service-based and facilities-based competition on NGA coverage, specification (1) regresses the percentage of DSL provided by new entrants against NGA coverage; specification (2) regresses the degree of standard cable coverage against NGA coverage; and specification (3) regresses both variables against NGA coverage. These regressions confirm that service-based competition has a strong negative effect on NGA coverage and that facilities-based competition has a strong positive effect on NGA coverage. All of these variables are statistically significant despite the fact that the lack of observations limits the analytical power of the regression.

There are, however, two potential ambiguities in these results. First, as noted earlier, DOCSIS 3 is the primary NGA platform, contributing more than any other technology to NGA coverage. Because cable networks were deployed to deliver multichannel video, it is arguable that NGA coverage is not the product of either facilities-based competition or service-based competition, but is rather the path dependent outcome of different forces. Second, because NGA coverage is the combination of DOCSIS 3 coverage, VDSL coverage, and FTTP coverage, NGA coverage and DOCSIS 3 coverage are likely to be highly correlated. Rather than indirectly spurring telephone-based broadband providers into action, or cable broadband could contribute directly by serving as a platform for NGA coverage in and of itself.

The statistically significant results for specification (1) suggest that cable modem coverage is not the only important driver of NGA coverage, but specifications (2) and (3) are arguably ambiguous in this regard, although it is possible to address this con-

TABLE 3:**Impact of Service-Based and Facilities-Based Competition on Total NGA Coverage**

	(1)	(2)	(3)	(4)
Dependent variable	Total NGA coverage	Total NGA coverage	Total NGA coverage	VDSL+FTTP coverage
Percentage DSL by new entrants	−0.809*** (0.247)		−0.244† (0.167)	−0.770*** (0.219)
Standard cable coverage		0.845*** (0.84)	0.818*** (0.093)	0.288** (0.115)
Percentage rural households	−1.477* (0.792)	−0.617*** (0.218)	−0.655* (0.367)	−1.283** (0.473)
GDP per capita	0.0028* (0.0015)	0.0014* (0.0008)	−0.0004 (0.0010)	0.0019† (0.0014)
Year	0.050*** (0.013)	0.046*** (0.012)	0.036** (0.015)	0.084*** (0.021)
Observations	55	55	55	55
R²	0.38	0.89	0.88	0.66

*** Significant at the 99% level;

** Significant at the 95% level;

* Significant at the 90% level;

† Significant at the 80% level.

cern by reinterpreting specification (3) by treating standard cable coverage as a control rather than as an independent variable. If so, it shows that service-based competition induced by access obligations still has a negative effect on NGA coverage. Another approach is reflected in specification (4), which isolates the competitive impact of cable broadband on incumbent telephone companies by eliminating Total NGA coverage as the dependent variable and replacing it with the sum of VDSL and FTTP. This new dependent variable does not include DOCSIS 3 coverage as one of its components and reflects only those aspects of NGA coverage that are spurred on by competition from cable.

Specification (4) confirms that that service-based competition has a statistically significant negative impact on NGA coverage provided by telephone companies, while facilitates-based competition from cable broadband has a statistically significant positive impact on telephone companies. Alternatively, cable broadband coverage may also be treated as a con-

trol. Either way, service-based competition has as a statistically significant negative correlation with NGA coverage.

Conducting the same analysis on the rural data leads to the same conclusions.

The data collected by the European mapping study thus provides empirical support for claims that facilities-based competition promotes investment in NGA architectures and that regulation-induced service-based competition discourages such investments. That these regressions were able to yield such strong results based on so few observations underscores the strength of these effects. Indeed, many European leaders have indicated that the time may have arrived when Europe should shift its focus away from promoting service-based competition and towards promoting investment if it is to achieve the goal of 100% NGA coverage by 2020 (Kroes 2013c; Süddeutsche Zeitung 2013 (quoting Angela Merkel)). The European experience also provides a real-world example of the

TABLE 4:**Impact of Service-Based and Facilities-Based Competition on Rural NGA Coverage**

	(1)	(2)	(3)	(4)
Dependent variable	Rural NGA coverage	Rural NGA coverage	Rural NGA coverage	Rural VDSL+FTTP coverage
Percentage DSL by new entrants	-0.635*** (0.199)		-0.208* (0.112)	-0.254* (0.139)
Standard cable coverage		0.774*** (0.075)	0.765*** (0.078)	0.297** (0.108)
Percentage rural households	-1.391*** (0.429)	-0.635** (0.258)	-0.590** (0.267)	-0.720** (0.303)
GDP per capita	0.0028** (0.0012)	-0.00006 (0.00071)	0.0011 (0.0008)	0.0010 (0.0009)
Year	0.045*** (0.016)	0.058*** (0.019)	0.030** (0.013)	0.031** (0.015)
Observations	55	55	55	55
R ²	0.50	0.90	0.84	0.58

*** Significant at the 99% level;

** Significant at the 95% level;

* Significant at the 90% level.

consequences of subjecting the Internet to the regulatory regime that governs traditional telephone service. This example should inform a wide range of current issues, including the debate over reclassifying

broadband Internet access as a Title II telecommunications service, the IP transition, and House Energy and Commerce Committee's ongoing initiative to update the U.S. communications laws.

3. EUROPEAN AND U.S. STUDIES ON INVESTMENT, ADOPTION, DOWNLOAD SPEEDS, UTILIZATION, AND PRICING

In addition to the mapping study, the EC has collected a great deal of other important information. First, the Commission collects investment data from the National Regulatory Agencies (NRAs). Second, the EC and the FCC collect information on broadband adoption. Third, the EC and the FCC have commissioned studies of broadband quality as measured in download speeds (including a comparison to advertised speeds), upload speeds, latency, and packet loss. Fourth, the EC and the FCC have commissioned studies of broadband pricing. In addition, commercial entities have collected data on the amount of bandwidth the average user consumes in different countries. Together these data enrich the picture pro-

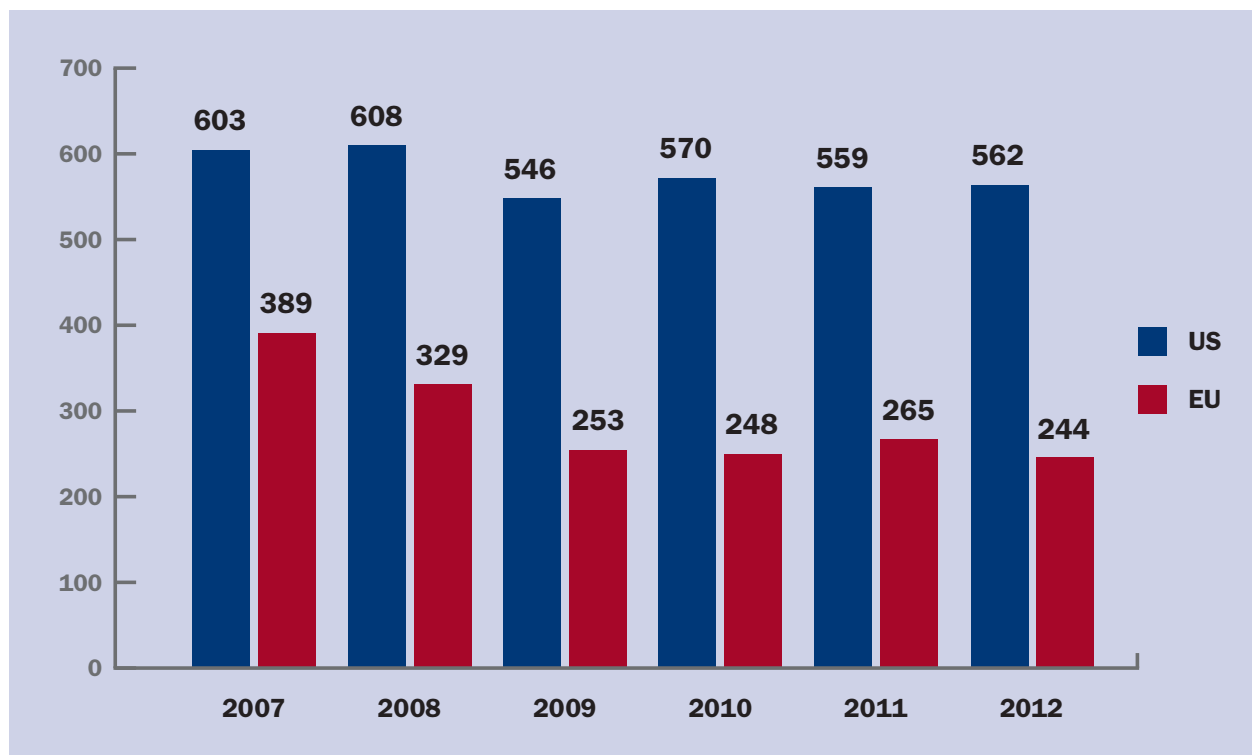
vided by the studies on broadband coverage. On the whole, they tend to confirm the conclusion that the U.S. is doing somewhat better than Europe with respect to broadband.

3.1 Investment

The EC collects data on revenue and investment in the electronic communications sector, which includes fixed-line telecommunications, mobile telecommunications, and pay television, among other things (EC 2009, 2010, 2014c). Although the U.S. government does not collect similar data, the U.S. Telecom Association (2013) compiles total broadband investments based on financial reports filed by leading providers. Household data from Eurostat (2014b) and the U.S. Census Bureau (n.d.) can permit examining investment levels on a per-household basis.

FIGURE 5:

Investment per Household in the Electronic Communications Sector in the U.S. and Europe, 2007–2012



Sources: EC (2009, 2010, 2014c); Eurostat (2014b); U.S. Census Bureau (n.d.); U.S. Telecom Association (n.d.).

The data on broadband investment reveals a stark disparity between the U.S. and Europe. From 2007 to 2012, per household investment in the U.S. more than doubled per household investment levels in Europe.

A paired t-test indicates that this difference is statistically significant at the 99.99% confidence level. The difference between the U.S. and European per-household investment levels has widened following the financial crisis in 2008. At the same time, revenue in the European electronic communications sector has declined by 1% to 2% each year since 2007 (EC 2009, 2010, 2014d).

The data also report investment levels on a per-country basis. If the U.S. were considered along with the European data, it would rank third in terms of per-household investment behind only Luxembourg at

\$759 per household and Ireland at \$584 per household (almost double the investment level in 2011) and just ahead of Denmark at \$457 per household.

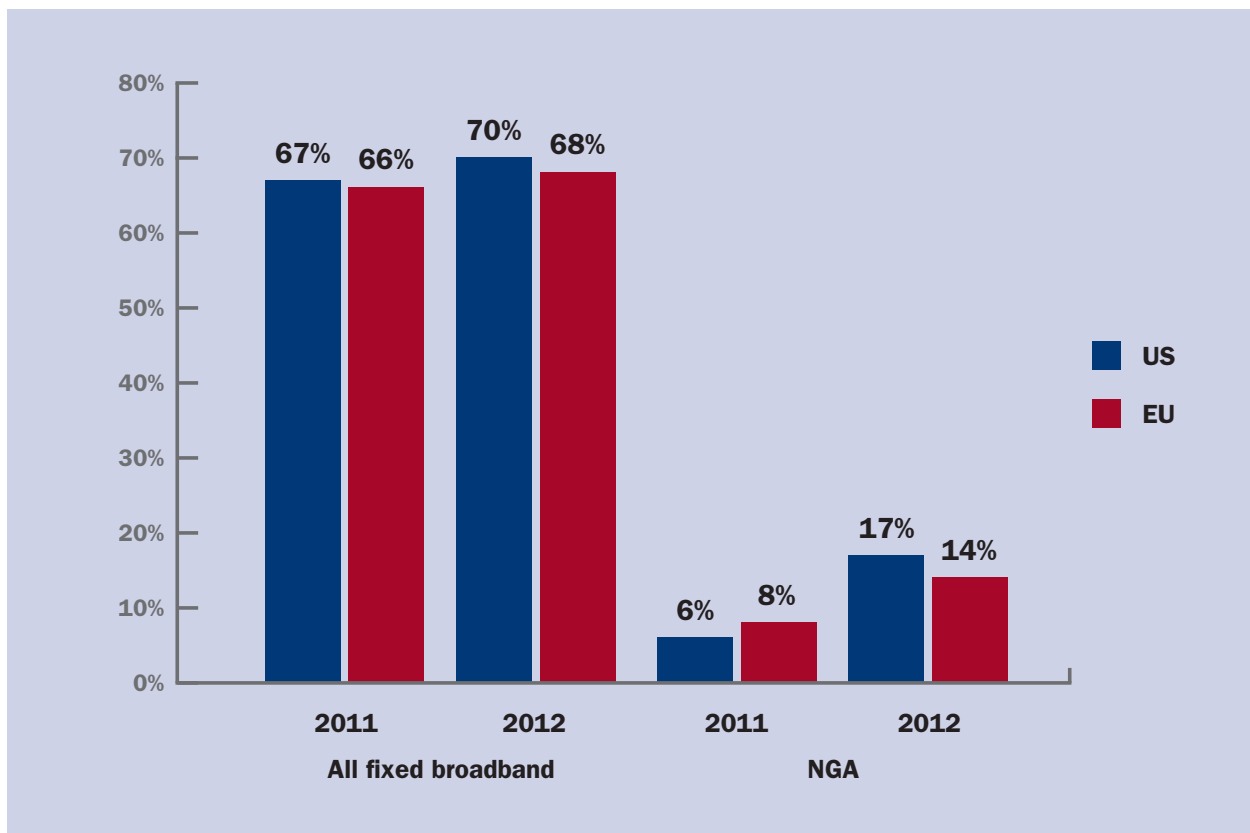
The investment data thus seem to confirm the effectiveness of the U.S. regulatory approach in providing incentives to invest. Unless European investment numbers rise sharply, Europe runs the risk of falling farther behind in high-speed broadband coverage.

3.2 Adoption

In addition to collecting information on NGA coverage, both the European Commission and the FCC collect data on NGA adoption. The FCC (2013b) reports subscription numbers directly, which can be combined

FIGURE 6:

Standard Broadband and NGA Adoption per Covered Household in the U.S. and Europe, 2011 and 2012



Sources: EC (2013b, 2014a); Eurostat (2014b); FCC (2013b); U.S. Census Bureau (n.d.).

with coverage numbers to determine the percentage of households where standard broadband and NGA service are available actually subscribe. The European Commission (2013c) reports information about total broadband subscribership and the percentage of broadband lines that are NGA, which makes it possible to calculate the number of NGA subscribers. The NGA subscription data can be combined with data on the number of households to calculate the rate NGA adoption by household.

In terms of standard broadband, household adoption numbers in the U.S. and Europe are very high and very similar, with the U.S. being slightly ahead. Given the slow growth, it would appear that standard broadband adoption was nearing saturation in 2012.

With respect to NGA, adoption is still in its nascent stages. The U.S. lagged slightly behind Europe in 2011, but surged ahead in 2012, reaching 17% of households as compared with 14% NGA penetration in Europe. The primary driver was an increase in the penetration in mobile wireless broadband providing NGA speeds from 0% of U.S. households to 7% of U.S. households.

The fact that adoption rates fall so far below coverage rates indicates that the impediments to adoption do not consist solely of lack of availability. This is confirmed by studies indicating that lack of interest and perceived need are more important obstacles than price or availability (EC 2013b, 13; Ofcom 2013a, 368; Pew Research Center Internet Project 2013). This underscores that supply-side initiatives are not enough and that policymakers should also continue to pursue demand-side programs for stimulating adoption of broadband.

3.3 Download Speeds and Other Measures of Broadband Quality

Both the EC and the FCC have recently sponsored studies of broadband quality that produced data that are significantly better than the data collected by the OECD, which relies entirely on advertised speeds. Academic studies indicate that the data produced by the government studies are also better than the widely cited data collected and reported by entities such as Akamai, Cisco, and Ookla. Ookla's NetIndex speed test runs as an application on end-users' computers, which means that the results depend as

much on the configuration of the end users' system, such as the operating system and the quality of the computer hardware, as the quality of the broadband network. Ookla also relies on crowd sourcing to provide its data, which means that its data may not be recruited from a representative sample and vary depending on the location of the server being used for the test. Akamai relies on data generated when end users access web content hosted on its content distribution network. Akamai's strong position in delivering web content (i.e., estimated at one fifth to one third of the world's web content) gives it sufficient scope to observe a broad range of lines in action, which avoids Ookla's potential self-selection and server-selection problems. Akamai still runs as an application on end-users' computers and thus is affected by differences in each end-user's setup. Akamai focuses on a single application (web browsing) and measures total connection speed between the end user and the Akamai servers. This means that it cannot account for connections to non-Akamai servers. The Akamai test cannot distinguish congestion in the access link caused by heavy utilization by the end user (Bauer, Clark and Lehr 2013; ITIF 2013).

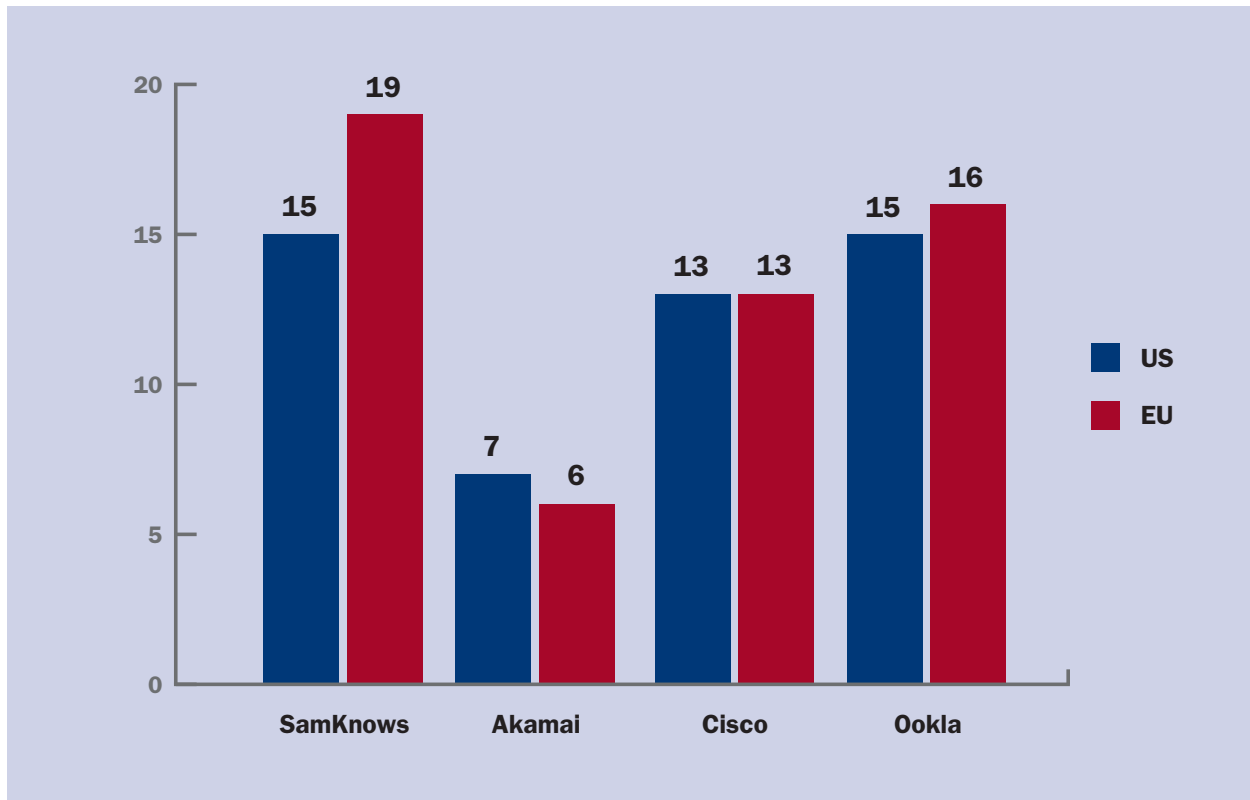
Fortunately for our purposes, the European Commission and the FCC both relied on a company called SamKnows to collect data on broadband quality. Instead of relying on the configurations end users' computers, SamKnows recruits panels of consumers who allow SamKnows to attach specially configured monitoring units to their broadband connections that periodically test download speeds, upload speeds, latency, and packet loss. Unlike crowd-sourced tests, SamKnows is able to ensure that its panel is unbiased and conducts checks to guard against sample bias. Because SamKnows employs its own hardware, its results do not vary with the configuration of individual end users' computers.

The consensus is that the SamKnows methodology is superior to other commercially available measures of average download speed, and that Akamai is likely the second best source of data (Bauer, Clark and Lehr

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The difference between the U.S. and European per-household investment levels has widened following the financial crisis in 2008.

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FIGURE 7:**Average Download Speeds in the U.S. and Europe, 2012**

Sources: EC (2013d); FCC (2012b); Akamai (2013); Cisco (n.d.); Ookla (n.d.).

2013; ITIF 2013). In fact, although the FCC used Ookla data in its international broadband comparison, it explicitly acknowledged that it would have preferred to use SamKnows data, which at the time did not exist for any European countries outside the UK (FCC 2012a App. F at 1 n.1). Moreover, the SamKnows studies commissioned by the European Commission and the FCC were conducted only one month apart, with the European study occurring in March 2012 and the U.S.

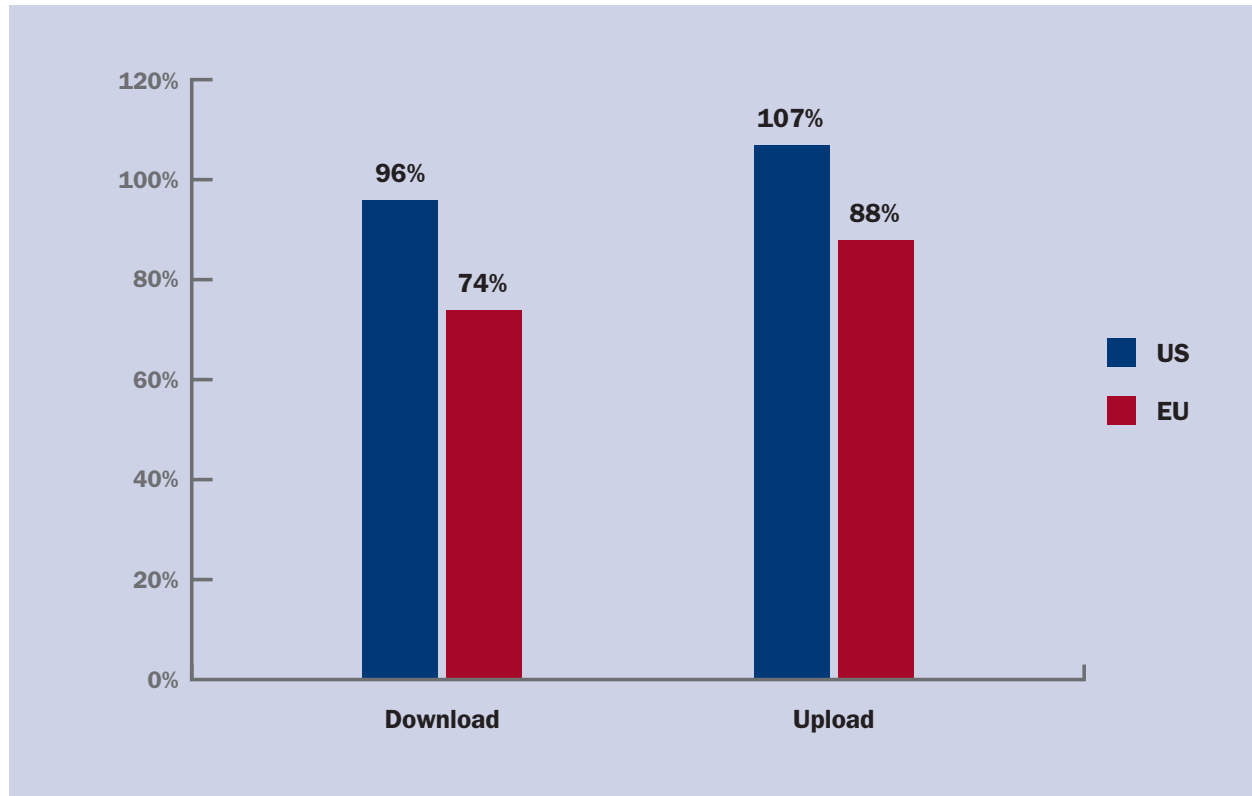
study occurring in April 2012. The results from these studies for average download speeds during peak times (weekdays 7:00-10:00 p.m.) are reported in Figure 7. The average download speeds reported by Akamai, Cisco, and Ookla's NetIndex for the end of 2012 are also provided for comparison.

The SamKnows studies indicate that average download speeds were somewhat faster in Europe than in the U.S. in 2012. The SamKnows data indicate that average upload speeds during peak times were also somewhat faster in Europe (6.2 Mbps) than in the U.S. (4.3 Mbps). Similar measures collected by other sources suggest that U.S. average download speeds were more or less the same as Europe's, although the Akamai results are somewhat lower than the other measurements. As noted above, all of these other measures are subject to at least some degree of methodological criticism. For the purposes of this study, however, the relative difference between U.S.

In terms of average download speeds during peak usage times (weekdays from 7:00-10:00 p.m.), U.S. providers deliver 96% of the advertised speeds, while European providers deliver only 74%.

FIGURE 8:

Actual Speeds as a Percentage of Advertised Speeds During Peak Times in the U.S. and Europe, 2012



Sources: EC (2013d); FCC (2012b).

and European download speeds are what is important, not the absolute magnitude.

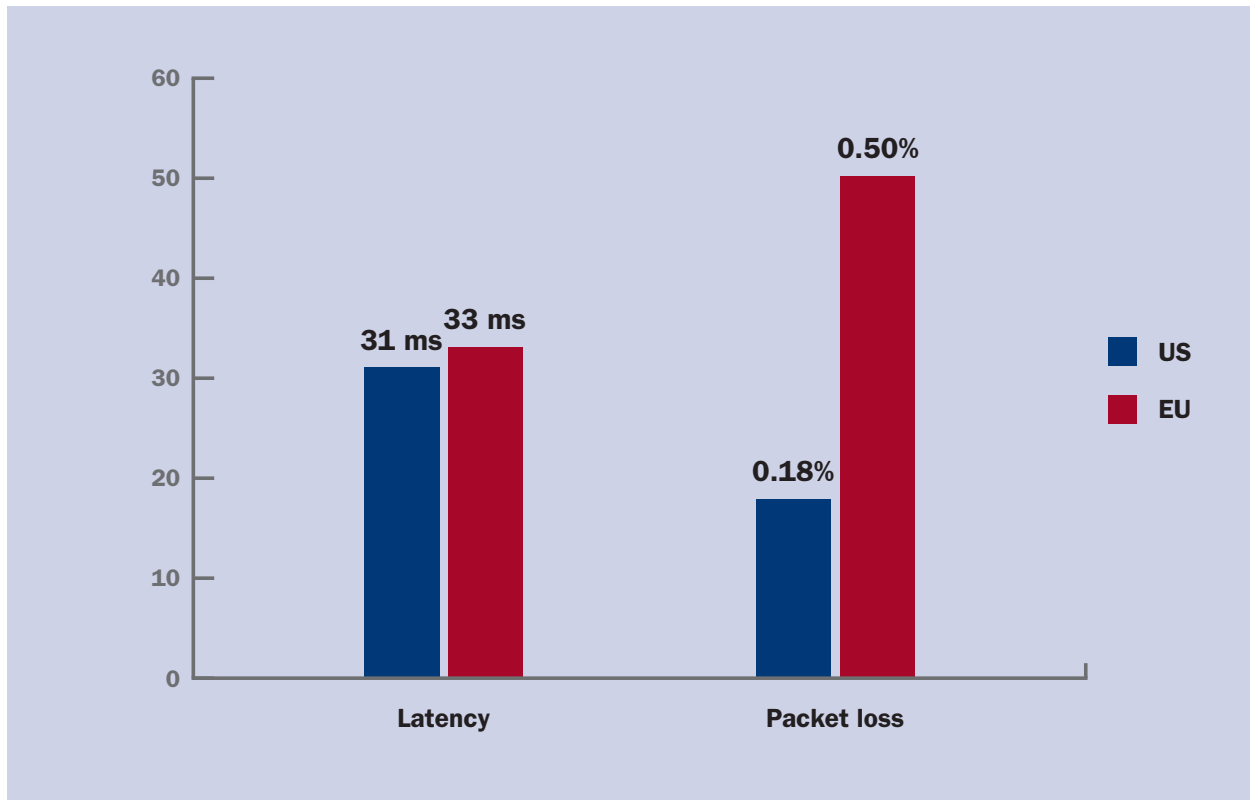
The European study was designed to compare actual to advertised speeds. As a result, the European study does not report country-level data for download speeds, although Akamai, Cisco, and NetIndex do. Under the Akamai data, which reports data for twenty-one EU countries plus Iceland and Norway, the U.S. would rank third in terms of average download speeds behind only the Netherlands and the Czech Republic as of the end of 2012. Cisco reports average download speeds for five Western European countries and for Western Europe as a whole. If the U.S. were compared with these other countries, it would rank third of six as of the end of 2012. NetIndex's country-level data is less flattering to the U.S. If the U.S. were ranked along with the twenty-six EU countries for which Net Index provides data as of the end of 2012, it would rank eighteenth.

In terms of actual and advertised speeds, U.S. ISPs fare better than their European counterparts. In terms of average download speeds during peak usage times (weekdays from 7:00-10:00 p.m.), U.S. providers deliver 96% of the advertised speeds, while European providers deliver only 74%. In terms of upload speeds, U.S. providers exceed their promises, providing actual upload speeds that average 107% of advertised

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This is particularly so because actual download speeds in Europe average 74% of the advertised speeds, whereas U.S. broadband services averages 96% of advertised speeds.

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FIGURE 9:**Latency and Packet Loss in the U.S. and Europe, 2012**

Sources: EC (2013d); FCC (2012b).

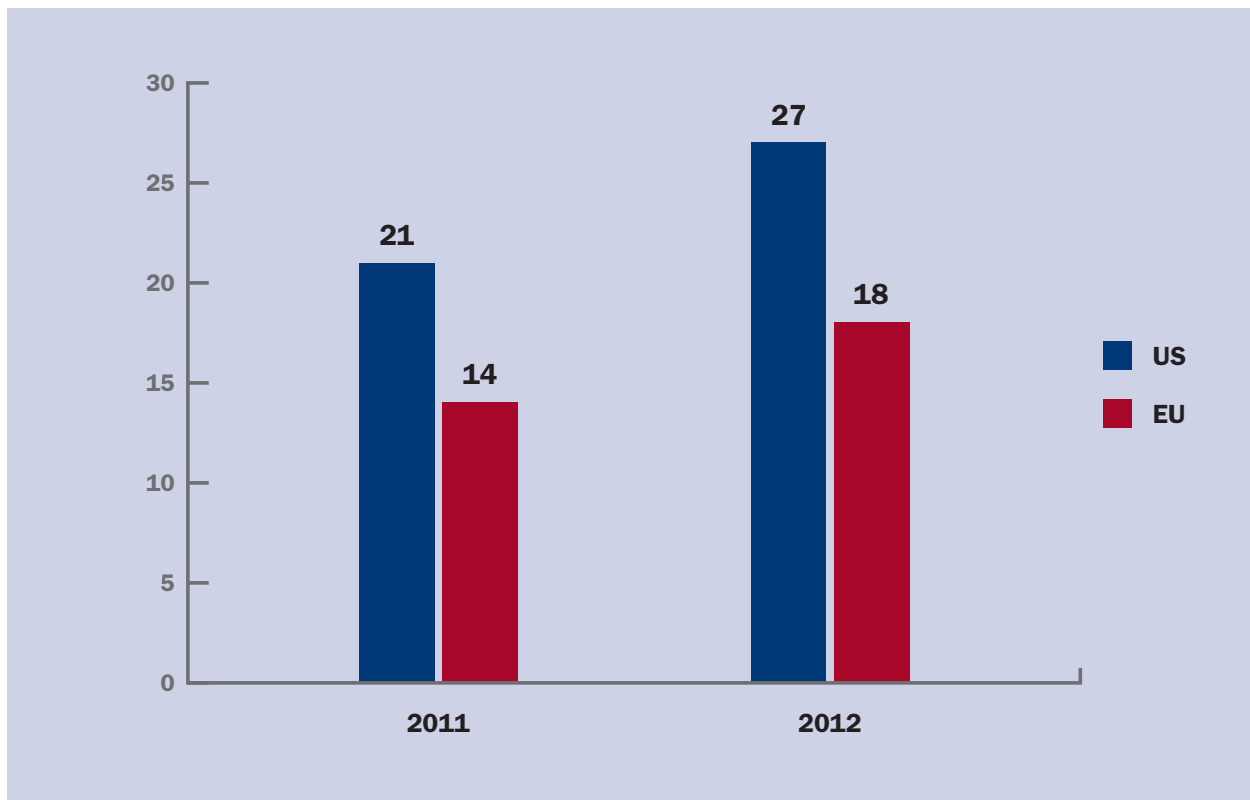
speeds during peak times, while European ISPs only provide 88% of their advertised speeds.

The European and FCC studies also included two other measures of broadband quality. First, latency is the amount of time that a packet takes to reach its destination. Note that latency is different from bandwidth. Bandwidth determines how much volume an end user can send; latency determines how long it takes to arrive at its destination. If the Internet were analogized to a pipe, bandwidth would be determined by the diameter of the pipe, while latency would be determined by its length (although other factors such as router configuration, firewalls, network protocols, and reliance and dispersion of data centers also have an impact). Latency and bandwidth are both critical to a good end-user experience. Unlike bandwidth, lower latency numbers represent better performance.

Second, packet loss is the percentage of packets that fail to reach their destination. Packet loss also affects the end-user experience, as any packets sent using TCP that are dropped must be resent, which slows down applications and adds additional burdens on the network. As with latency, for packet loss a lower number means better performance.

On both of these additional metrics, the European study indicates that U.S. ISPs outperformed their European counterparts in 2012. During peak times (weekdays from 7:00-10:00 p.m.), average latency is lower in the U.S. (31 milliseconds) than in Europe (33 milliseconds). Similarly, packet loss during peak times is lower in the U.S. (0.18%) than in Europe (0.50%).

The data suggest that average download and upload speeds may be somewhat faster in Europe, but that the gap is reasonably small. On other measures of broadband quality, such as actual as a percentage of

FIGURE 10:**Monthly IP Traffic per User in the U.S. and Europe (GB/month), 2011 and 2012**

Sources: Cisco (n.d.).

advertised speeds, latency, and packet loss, the U.S. fares better than Europe.

3.4 Utilization

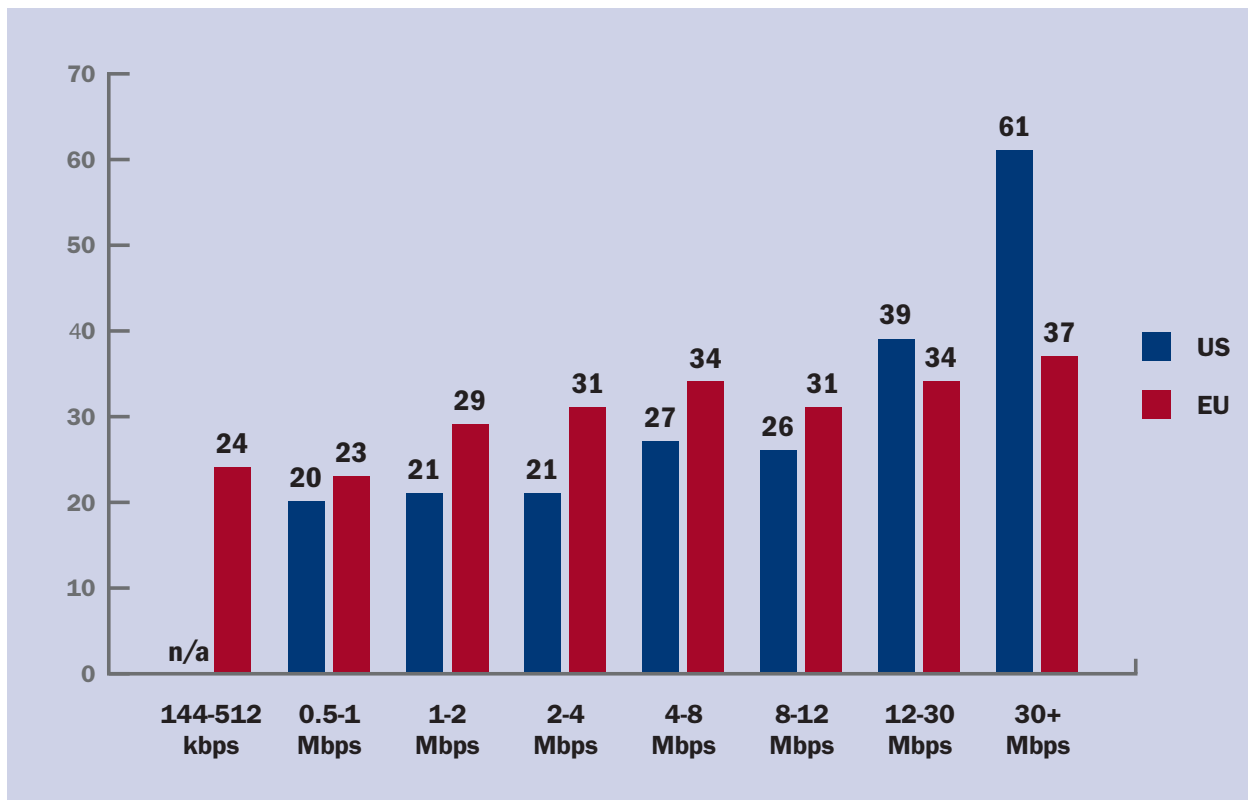
In some ways, download speeds and the other metrics of broadband quality are secondary measures of the value of broadband service. It is arguable that the better metric is total traffic per user, as a real measure of the value of a broadband connection is total amount of usage. Neither the European Commission nor the FCC reports data on bandwidth usage. Cisco does report data on the amount of traffic that each user generates each month for the United States, the five largest Western European countries, and for a category it calls the “Rest of Western Europe,” which includes thirteen other countries. While the overlap with the European Union is not perfect, the European

utilization data can be aggregated and weighted to provide the basis for a comparison of utilization.

These data reveal that in both 2011 and 2012, U.S. users consumed 50% more bandwidth than European users. Evaluating the same data on a per household basis does not materially change the analysis. The heavier utilization suggests that U.S. users are deriving greater value from their Internet connections than European users, as a fast connection only provides value to the extent it is used.

3.5 Pricing

The EU also commissioned a study of broadband pricing that was conducted in February 2012. The study identifies large ISPs representing 90% of subscribers up to a maximum of 8. It looks at the lowest and

FIGURE 11:**European Study of Pricing of Standalone Broadband in the U.S. and Europe, 2012**

Sources: EC (2012b).

median advertised price for all EU countries; other European countries, including Iceland, Liechtenstein, Macedonia, Norway, Switzerland and Turkey; and the states of California, Colorado, and New York. In so doing, it attempts to take into account contract length, data caps, nonrecurring costs, promotions, differences in volume and other services, VAT, and purchasing power parity. The study tracks standalone broadband as well as two-product and three-product bundles, although prices for bundles that include television typically reflect the high cost of program acquisition and not just the cost of Internet service. Unlike other studies that have received recent attention (see, e.g., New America Foundation 2012), the European study looks at pricing nationwide instead of particular cities and reports data for standalone broadband in addition to bundles, which reflect content acquisition costs for video.

Despite these refinements, the resulting methodology is still subject to a number of caveats. The study is

based on advertised prices, but discounts and other measures can cause actual prices to differ. Although the study takes advertised discounts into account, it does not reflect any special discounts that may be extended. In addition, the study is based on advertised speeds, which only imperfectly reflect actual speeds. This is particularly so because actual download speeds in Europe average 74% of the advertised speeds, whereas U.S. broadband services averages 96% of advertised speeds. In addition, broadband pricing can obscure important differences in utilization. Finally, with respect to all of these measures, simply choosing the median fails to take into account the fact that some providers have many more subscribers and thus are more representative. Pricing data should thus be regarded as suggestive rather than definitive.

To isolate the cost of Internet service and to eliminate the impact of program acquisition costs for television or universal service subsidies and other similar sur-

charges for voice, the discussion that follows focuses on the price of standalone broadband. Figure 11 reports the median EU price for standalone broadband in each speed tier included in the European study. The U.S. price is a simple average of the prices reported for California, Colorado, and New York.

The data indicate that U.S. broadband prices are lower than European prices for all service tiers up to 12 Mbps. Even for services between 12 Mbps and 30 Mbps, the price difference is relatively small. Only for speeds greater than 30 Mbps were U.S. prices significantly higher. The fact that the average U.S. user consumes 50% more capacity than the average European user will inevitably show up in the pricing. Indeed, the price difference for 30+ Mbps service (\$61 in the U.S. vs. \$37 in the EU) matches almost exactly the difference in monthly household bandwidth usage (60 GB in the U.S. vs. 40 GB in Western Europe) (Cisco n.d.).

Thus, for lower speeds, the European study provides reason to question whether U.S. prices are in fact higher than European prices. Data collected by the ITU (2013, table 3.2) and the Berkman Center (2010, 75) similarly indicate that U.S. entry-level broadband pricing is lower than European entry-level broadband pricing, while other studies found it to be roughly comparable (OECD 2013 fig. 7.6; FCC 2012a fig. 2a). The higher levels of utilization in the U.S. provide a strong justification for the price difference for higher-speed tiers. Indeed, there is a strong argument that charging low-volume users less and charging high-volume users more may represent a fairer and more efficient allocation of costs.

The European pricing study thus undercuts claims that high U.S. prices are discouraging potential end users from adopting broadband. The FCC and ITU data confirm that U.S. broadband prices are lower for lower speeds. Indeed, the ITU indicates that the U.S. has the third cheapest entry-level price in the world. U.S. prices are somewhat higher than European prices for speeds greater than 30 Mbps. In fact, this is precisely the type of pricing structure that would best promote broadband adoption and alleviate the digital divide. Even the higher prices for higher speed services can be justified by the fact that U.S. users consume 50% more bandwidth than their European counterparts.

* * *

The data reported in the European mapping study thus contradict claims that U.S. broadband service is falling behind Europe in terms of availability. In addition, regression analysis of these data indicate that the U.S. approach of promoting facilities-based competition is more effective in stimulating the buildout of high-speed networks than the European approach of promoting service-based competition. Moreover, the data on investment, average download speed, utilization, and pricing are thus all at odds with blanket assertions that U.S. broadband is too slow and too costly, since U.S. investment levels are higher, average download speeds are slightly below or comparable, entry-level pricing is lower, and utilization levels are higher. On the whole, the data are more consistent with the position that the U.S. is ahead of Europe in the broadband race and well positioned to extend its lead.

The widescale availability and relatively affordable pricing in lower speed tiers underscores the fact that price is not the primary barrier to broadband adoption. Indeed, studies indicate that households who have fast service would only pay \$3 more for very fast service (Rosston, Savage, and Waldman 2011). Both U.S. and European studies have consistently shown that lack of interest and lack of skills are far greater barriers to broadband adoption than are pricing and coverage (EC 2013b, 13; Ofcom 2013a, 368; Pew Research Center Internet Project 2013). Any true welfare metric should also determine the relationship between broadband

4. COUNTRY CASE STUDIES

The data provided by the European and U.S. mapping studies provide a fairly compelling basis for concluding that the U.S. is not behind Europe in the broadband race. That said, bare statistics often do not tell the full story. The eight country case studies presented in this section add insight to the top-level statistical analysis. These case studies focus on the more established economies of Western Europe, including the five largest EU countries (France, Germany, Italy, Spain, and the United Kingdom) and three additional countries of particular interest (Sweden, Denmark, and the Netherlands).

Spain followed a more conventional pattern, in which competition from cable modem service has spurred the incumbent telephone provider to invest in upgrading its network.

The analysis organizes the countries into three categories based on (1) the level of development of the cable modem industry, measured by whether cable modem coverage exceeded coverage levels of the EU as a whole, and (2) the primary broadband strategy pursued by the telephone industry, determined by whether FTTP coverage was greater than VDSL coverage or vice versa. The resulting categories are:

- Countries where telephone companies faced *weak* competition from cable and emphasized *FTTP over VDSL* (Sweden, France, and Italy),
- Countries where telephone companies faced *weak* competition from cable and emphasized *VDSL over FTTP* (none),
- Countries where telephone companies faced *strong* competition from cable and emphasized *FTTP over VDSL* (Denmark and Spain), and
- Countries where telephone companies faced *strong* competition from cable and emphasized *VDSL over FTTP* (the Netherlands, UK, and Germany).

A close analysis of these country case studies reveals an interesting pattern that raises serious doubts about certain countries' continuing emphasis on FTTP. First,

the group of countries that did not face significant facilities-based competition from cable (all of which emphasized FTTP over VDSL) reported the three lowest NGA coverage levels of all the countries included in this study and ranked 20th, 25th, and 28th out of 28 EU countries in this regard even though Sweden and France are often held up as role models that other countries should follow. NGA coverage in Sweden was only slightly above EU coverage levels despite the presence of strong FTTP deployments (with 40% to 50% of these lines being government owned) and remains well below the NGA coverage levels in the U.S. The emphasis on FTTP also had an adverse impact on rural NGA deployments. The high cost of FTTP is leading France and Italy to consider shifting their focus to VDSL.

In contrast, all of the countries in which cable broadband was highly developed achieved NGA coverage rates that exceeded EU coverage levels. Indeed, most of these countries report that cable broadband constituted the primary driver of NGA coverage. Among these, two countries have historically emphasized FTTP over VDSL (Denmark and Spain). Denmark is unusual in that it is the only country in which the incumbent telephone operator was permitted to continue to be the primary cable operator. As a result, competition came from energy companies deploying FTTP instead of cable modem service, although these new entrants have struggled financially. Spain followed a more conventional pattern, in which competition from cable modem service has spurred the incumbent telephone provider to invest in upgrading its network. The primary emphasis has been on FTTP, although the Spanish regulator has recognized that VDSL is likely to play an important role outside of the largest cities.

Countries with strong cable modem systems and where incumbent telephone companies emphasized VDSL also exceeded EU benchmarks for NGA coverage. An underappreciated gem is the Netherlands, which had the second highest NGA coverage rates in the EU. The Netherlands achieved this based on nearly universal DOCSIS 3 coverage, based on its legacy of municipally subsidized cable television systems, and a recognition that it must balance the financial risks associated with FTTP with investments in VDSL. The other two countries in this group (the UK and Germany) have embraced VDSL largely to the exclusion of FTTP. In both cases, strong competition from cable is the primary driver of VDSL investment, with both countries regarding VDSL as being able to deliver sufficient bandwidth to justify postponing the more significant investments associated with FTTP for the time being.

With respect to LTE, early deployments typically depended on two key considerations. The first was the timing of the auction to allocate the 2.6 GHz licenses. The second was a willingness to allow current providers to reallocate their 2G spectrum in the 1.8 GHz band initially allocated to GSM to LTE.

A few comments on the data sources for the tables are in order. The primary data sources are the mapping studies commissioned by the EC and the U.S. government measuring coverage as of the end of 2012 (EC 2013a; NTIA and FCC 2013a and 2013b). Data on European investment levels are from the data collected by the EC (2014b). Pricing data are from the EC pricing study (2012b). Download speed data is from Akamai (2013). Bandwidth usage data are from Cisco (n.d.). Population density and GDP per capita (measured in terms of purchasing power parity) are from Eurostat (2014a, 2014c).

4.1 Weak Competition from Cable and FTTP over VDSL

Three study countries faced DOCSIS 3 penetration that fell below EU levels: Sweden, France, and Italy. All of these countries have historically emphasized FTTP over VDSL. Strikingly, these three countries represent the lowest NGA coverage rates of any countries included in this study. In fact, Italy had the lowest NGA coverage of any country in the entire EU, and France had the fourth lowest. Only Sweden enjoyed NGA coverage that

exceeded NGA coverage levels for the EU as a whole, and even that advantage was relatively minor (57% vs. 54%) and ranked it 20th among 28 EU countries.

4.1.1 Sweden

Sweden is often regarded as a leader in broadband infrastructure, having issued the first national broadband plan and established the first LTE network. Sweden remains one of Europe's strongest advocates for FTTP. Media articles often identify Sweden as a country the U.S. should consider emulating, owing primarily to the prevalence of FTTP. These commentators assert that services are much faster and cheaper in Stockholm than in the U.S. (see, e.g., *New York Times* 2014b; *USA Today* 2014). Sweden is accomplishing this even though their population density is lower than the United States' (NPR 2014).

Sweden has FTTP coverage rates that far exceed the FTTP coverage rates in the EU as a whole, driven by large public subsidies of FTTP. This advantage has not translated into significantly greater availability of high-speed broadband services, however. NGA coverage was 53% in 2011 and 57% in 2012, which was only slightly above the EU NGA coverage rates of 48% in 2011 and 53% in 2012 and far below the U.S. NGA coverage rates of 72% and 81%. Sweden's 57% NGA coverage rate ranked it 20th among 28 EU countries, and among the countries in this study, Sweden trailed every country except for France and Italy. Thus, even though Sweden is generally seen as a leader in broadband

	Total NGA	Rural NGA	DOCSIS 3 cable	VDSL	FTTP	LTE	Pct. DSL shared
Sweden	57%	6%	35%	17%	46%	93%	37%
Europe	54%	12%	39%	25%	12%	27%	46%
U.S.	82%	48%	81%	10%	23%	86%	n/a

	Investment per HH	Price 12-30 Mbps	Avg. speed Mbps	Bandwidth per user	Rural HHs	Population density	GDP per capita
Sweden	\$280	\$18.15	7.3	n/a	17%	23	125
Europe	\$244	\$27.64	5.7	18	15%	116	100
U.S.	\$562	\$28.76	7.4	27	19%	34	152

technology, it is actually lagging behind countries that have emphasized VDSL, such as the UK and Germany, and other countries that have pursued more balanced strategies, such as the Netherlands, Denmark, and Spain. Because of its fiber-oriented strategy, NGA coverage is projected to grow very slowly through 2018, at which time Sweden will lag every major European country except Italy (Analysys Mason 2013).

The problem was even more pronounced in rural areas. Swedish rural NGA coverage reached only 5% in 2011 and 6% in 2012. This fell short of the EU rural NGA coverage rates of 9% and 12% and fell far short of the U.S. rural NGA coverage rates of 38% and 48%. Thus, while the emphasis on FTTP did support world-class service in Sweden's largest cities, it also caused the urban-rural digital divide to become worse.

Broadband prices remain quite affordable, and download speeds are close to those of the U.S., although investment levels are somewhat lower. Sweden did enjoy a sharp increase in LTE coverage from 48% in 2011 to 93% in 2012, which allowed it to surpass LTE coverage rates in the U.S.

One brief observation about population density is in order. Although some commentators point out that Sweden has a lower population density (23 people per square kilometer) than the United States (34 people per square kilometer), a higher percentage of Swedes live in urban areas than Americans. As noted above, the low Swedish population density figures reflect the fact that large amounts of Swedish territory are unoccupied and need not be covered by broadband. The European mapping study indicates that only 17% of Swedes live in rural areas, a statistic corroborated by Sweden's national broadband plan, (Government Offices of Sweden 2013).

Furthermore, NGA buildout is further facilitated by the

fact that half of all Swedes live in apartment buildings (ITIF 2013).

VDSL

VDSL has represented a fairly minor technology in Sweden, covering only 17% of the country in both 2011 and 2012, somewhat below the EU benchmarks of 19% and 25%. Swedish Rural NGA coverage was nominal at 0.2% both years, again below the EU benchmarks of 3% and 5%.

Although telephone service was initiated by private companies, by 1918 the service had become a state-owned monopoly. The incumbent Telia was partially privatized in 1990 and merged with the Finnish incumbent Sonera in 2003. The Swedish government still owns 37% of Telia Sonera, and the Finnish government still owns 13.2%.

DSL was commercially introduced in Sweden around 1999 and quickly became the leading broadband technology through subscriptions provided by the incumbent Telia and by competitors such as Telenor, who leased lines following the Swedish regulator's decision to impose local loop unbundling. Sweden was also an early pioneer in VDSL, with new entrant Bredbandsbolaget (now part of Telenor) conducting tests as early as October 2005 and Telia Sonera providing service starting in March 2008 and pledging SEK 500 million to expand the service in 2012.

The Swedish regulator (PTS) has not supported upgrading the copper network to VDSL because it believes that VDSL will achieve 100 Mbps download speeds only in densely populated areas that are already likely to receive service from FTTP (PTS 2013b). Particularly given the government's continued ownership of a large stake in Telia Sonera, Sweden is likely to continue to emphasize FTTP over VDSL.

DOCSIS 3

Cable broadband has been an important contributor to NGA coverage in Sweden, but has not been the leading NGA technology. DOCSIS 3 was available in 31% of Swedish households in 2011 and 35% in 2012. This fell slightly short of the EU benchmarks of 37% and 39% and well below the U.S. coverage rates of 72% and 81%. Rural DOCSIS 3 coverage was almost nonexistent at 0.1% in both 2011 and 2012.

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Television in Sweden was provided exclusively through public broadcasters until 1981, when local master antenna television systems began retransmitting international satellite programming. In 1983, the government agency responsible for telecommunications in Sweden established Televerket Kabel-TV, which would ultimately occupy 75% of the cable television market. The company was named Svenska Kabel-TV during the 1993 divestiture that created Telia and later rebranded as Telia InfoMedia TeleVision in 1996. Telia prepared to spin off its cable properties in 1999 in anticipation of its proposed but ultimately unsuccessful merger with Telenor and finally sold the business to private equity firm EQT as part of its 2003 merger with Sonera. Since that time, it has been acquired by a succession of private equity funds, including the Carlyle Group and Providence Equity Partners (2006) and BC Partners (2011).

Cable has remained a relatively minor broadband technology, representing 18% of the market for fixed broadband. Moreover, the number of cable broadband subscriptions began to decline slightly in 2012 in the face of vigorous competition from FTTP and LTE (PTS 2013b). As a result, the Swedish regulator PTS does not consider DOCSIS 3 technology as playing a critical role in helping Sweden reach the speed and coverage targets established by the Digital Agenda.

FTTP

FTTP covered 46% of Swedish homes in 2011 and 2012, well above EU coverage levels of 10% and 12% as well as U.S. coverage levels of 17% and 23%. Sweden is thus one of Europe's leaders in FTTP, ranking behind only Lithuania, Latvia, and Romania.

Unsurprisingly, FTTP has focused on urban areas. FTTP reached only 5% of Swedish rural households in 2011 and 6% in 2012. This was slightly above the EU benchmarks of 2% and 5%, but slightly below the U.S. benchmarks of 6% and 8%.

Government subsidies have long played a key role in promoting FTTP in Sweden. For example, Government Bill 1999/2000:86, entitled "An information society for all," provided for SEK 5.6 billion (\$640 million) in government funding to defray the SEK 40 billion (\$4.6 billion) to extend optical fiber to rural areas, with the total cost of extending fiber to all of Sweden reaching SEK 57 billion (\$6.6 billion). Government Bill 2004/05:175, entitled, "From an IT policy for society

to a policy for the information society," allocated €525 million (\$76 million) for infrastructure funding and €57.5 million (\$7 million) for structural funds and other regional grants. The result was pervasive government ownership of broadband facilities. According to the Swedish national broadband plan, central government agencies and government-owned companies owned 15% to 20% of the nation's fiber infrastructure as of 2008, and another 25% to 30% was owned by municipalities (Government Offices of Sweden 2009, 22, 25).

One of the primary reasons that LTE has deployed so quickly in Sweden is the speed with which it conducted its spectrum auctions. In May 2008, Sweden became the second country (behind only Norway) to auction its 2.6 MHz spectrum. The licenses were technology and service neutral.

The central government has continued to provide public support for FTTP. For example, from 2010 through 2012, PTS has provided SEK 178.5 million (\$27 million) in funding to provide 35,000 homes and businesses in rural areas with broadband via fiber, which represents a cost of roughly \$800 per location. PTS allocated an additional SEK 160 million (\$25 million) for 2013. During the same period, municipalities continued to invest SEK 8–9 million (\$1.2–1.3 million) each year. Private companies have invested roughly SEK 8–9 billion (\$1.1–\$1.2 billion) annually since 2005. In 2012, Telia Sonera announced that it would invest SEK 5 billion (\$800 million) to extend FTTP to 1 million additional homes.

PTS made clear in 2013 that it regards FTTP as the only technology capable of achieving the 100 Mbps targets established by the Digital Agenda. Moreover, PTS has an ongoing proceeding that would include FTTP in the product market for network infrastructure. If finalized, this proceeding would require Telia Sonera to provide unbundled access to its FTTP network as well as its copper network. The proceeding is scheduled for completion in spring 2014.

Although these efforts provided Sweden with strong FFTP coverage rates, they did not translate into NGA coverage levels that significantly exceeded the prevailing levels in the EU or the U.S. In addition, the emphasis on FFTP had an adverse impact on rural coverage, where FFTP is unviable.

LTE

Sweden has long been a global leader in LTE. Swedish LTE coverage surged from 48% in 2011 to 93% in 2012, well above the EU benchmarks of 8% and 27%. During this time, Sweden appears to have passed the U.S. in terms of LTE coverage, which was 68% in January 2012 and 86% in October 2012. Rural LTE coverage rates made even more impressive gains, skyrocketing from 7% in 2011 to 71% in 2012, far exceeding the EU benchmarks of 5% and 10%.

One of the primary reasons that LTE has deployed so quickly in Sweden is the speed with which it conducted its spectrum auctions. In May 2008, Sweden became the second country (behind only Norway) to auction its 2.6 MHz spectrum. The licenses were technology and service neutral.

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In March 2011, Sweden became the second country (behind only Germany) to auction its 800 MHz digital dividend spectrum.

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In December 2009, Telia Sonera used this spectrum to deploy the world's first LTE service. Telia Sonera executives acknowledged that the early deployment was mostly to gain prestige and that the company recognized that the lack of devices meant that subscriptions would be predictably slow to develop until 2013. In November 2010, Tele2 and Telenor began offering LTE through a spectrum-sharing joint venture known as Net4Mobility, which achieved its goal of 99% coverage by early 2013.

3 Sweden would enter the fray shortly, albeit following a somewhat different strategy. In December 2010, 3 Sweden acquired the unpaired block that Intel won in the 2.6 GHz auction and combined it with the paired block 3 Sweden acquired in the same auction. The

company then used the combined spectrum holdings to launch a multimode LTE service in December 2011. 3 Sweden plans to cover 95% of the country by the end of 2014.

In March 2011, Sweden became the second country (behind only Germany) to auction its 800 MHz digital dividend spectrum. A spectrum cap of 2x10 MHz per bidder was imposed by a decision by PTS. In addition, the recipient of one designated license (won by Net4Mobility, which is a joint venture of Tele2 and Telenor) would bear the obligation to cover the permanent homes and fixed places of business identified as lacking 1 Mbps broadband service. The government provided a subsidy of SEK 300 million (\$47 million) to support the buildout of these homes. The 800 MHz spectrum is now being used to complement the LTE networks deployed at 2.6 GHz and to provide rural coverage, although the 2x10 MHz cap means that each 800 MHz licenses provides only half of the spectrum required for maximum LTE performance.

In October 2011, Sweden auctioned off spectrum in the 1.8 GHz band that had previously been allocated to GSM. Telia Sonera and Net4Mobility each acquired licenses, although neither would deploy service until 2013. In addition, 900 MHz and 1800 MHz will be gradually developed for 4G network for the future as well, with the transition for 1800 MHz starting in 2013.

* * *

Sweden has chosen to emphasize FFTP over VDSL and has achieved impressive level of FFTP coverage. It achieved these coverage numbers through large government subsidies. In the aftermath of the 2008 financial crisis, other countries would no doubt find it difficult to follow the same path. More importantly, these large public investments in FFTP failed to create any significant advantages in terms of NGA coverage. At 57%, Sweden's NGA coverage is only slightly above the 2012 EU benchmark of 54% and ranks 20th among 28 EU countries.

The shortcomings of emphasizing FFTP without the support of collateral technologies are manifest in Sweden's poor NGA coverage in rural areas. The high cost of FFTP means that it is not commercially viable in many rural areas. As a result, Sweden's rural NGA coverage is roughly half that of the rest of Europe and one eighth that of the U.S. Thus, while Sweden's commitment to FFTP has no doubt yielded impressive service in Stockholm and other cities, those benefits

are not available on a nationwide basis. This stands in stark contrast to other countries, where greater reliance on DOCSIS 3 and VDSL has supported more extensive rural coverage.

4.1.2 France

France is another country that is often identified as a broadband leader and is often lauded for having fast service and cheap prices. As was the case with Sweden, France has emphasized FTTP over other NGA technologies, and companies such as Free are renowned for offering low-cost service.

The data on NGA coverage paint a very different picture. France achieved only 23% NGA coverage in 2011 and 24% in 2012, both of which were less than half the EU benchmarks of 48% and 54% and far below the U.S. benchmarks of 73% and 82%. Indeed, French NGA coverage is the fourth worst in the entire EU. French rural NGA coverage is virtually nonexistent, checking in at 0% in 2011 and 1% in 2012, far short of EU levels of 9% and 12% and U.S. levels of 38% and 48%. French LTE coverage was 0% in 2011 and only 6% in 2012, as compared with 8% and 27% in the EU and 68% and 86% in the U.S. Although prices are low and investment levels are above average, download speeds lag behind European norms.

Consistent with the tradition of strong government involvement in shaping battles between business

rivals that dates back to 17th-century finance minister Jean-Baptiste Colbert, the central government has asserted greater control over the French telecommunications industry than was the case in other countries, beginning with the government's assertion of a monopoly over the optical telegraph system in 1792 (Millward 2005, 104; *New York Times* 2014a). For example, after initially permitting private development of the telephone system in 1879, the French subsequently nationalized the phone system in 1889. Not only did the central government insist on building the phone system itself. Because the French government lacked the funds to expand the system, citizens who wished to have service had to raise the funds to cover the costs of construction and loan them to the government interest free, with the principal to be repaid out of the profits if the system proved successful. This forced consumers to bear all of the risk of extending telephone service but receive none of the potential benefits (Brock 1981).

This legacy of top-down planning caused French telephone coverage to lag behind the rest of Europe well into the 1970s and is reflected in the well-known state-run Internet forerunner known as Minitel. In addition, the French were unenthusiastic supporters of liberalization during the 1990s and instead favored maintaining the telephone system as a government-owned monopoly. Indeed, the French government continues to own 27% of Orange, 13.5% directly and 13.5% indirectly through the French Sovereign Fund (*Fonds stratégique d'investissement*).

	Total NGA	Rural NGA	DOCSIS 3 cable	VDSL	FTTP	LTE	Pct. DSL shared
France	24%	1%	21%	0%	7%	6%	56%
Europe	54%	12%	39%	25%	12%	27%	46%
U.S.	82%	48%	81%	10%	23%	86%	n/a

	Investment per HH	Price 12-30 Mbps	Avg. speed Mbps	Bandwidth per user	Rural HHs	Population density	GDP per capita
France	\$326	\$24.25	4.8	12	18%	103	109
Europe	\$244	\$27.64	5.7	18	15%	116	100
U.S.	\$562	\$28.76	7.4	27	19%	34	152

ADSL service appeared in France 1999 and soon saw vibrant service-based competition emerge through unbundling. Somewhat surprisingly, VDSL was slow to develop, with coverage rates of 0% in both 2011 and 2012, well below EU coverage rates of 19% and 24%.

The reason is simple: consistent with its tradition of centralized control over the infrastructure, the French regulator, ARCEP, refused to approve VDSL as a standard. As a result, it focused instead on promoting FTTP and ADSL+. Even as late as 2010, Orange was continuing to invest in improving ADSL coverage from 98.6% to 99% by 2013.

It was not until April 2013 that ARCEP finally approved VDSL2, and even then it offered the pessimistic assessment that VDSL2 would benefit only 16% of all lines in France and would provide 30 Mbps service in only 6% of French homes. ARCEP thus saw VDSL2 as a complementary technology that it would support with public funding only if it represented an intermediate step towards FTTP. Orange, Free, and SFR formally launched VDSL2 service in October 2013, although the firms had conducted small-scale field trials before that date. Orange has begun to deploy vectoring technologies that can support download speeds of 50 Mbps in many areas and download speeds of up to 100 Mbps under optimal conditions.

In February 2014, ARCEP opened a consultation on a new VDSL technology known as Fiber to the Distribution Point (FTTDP) that will push fiber even closer to the consumer. Many see FTTDP as a way to deliver 100 Mbps in a more affordable manner than FTTP. Given the high costs of FTTP, these observers believe that France may well switch focus away from FTTP and towards VDSL.

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French rural NGA coverage is virtually nonexistent, checking in at 0% in 2011 and 1% in 2012, far short of EU levels of 9% and 12% and U.S. levels of 38% and 48%.

.....

DOCSIS 3

French cable broadband has also tended to lag behind the rest of Europe as well. DOCSIS 3 was available in only 21% of French homes in 2011 and 2012. These coverage rates were well below the EU rates of 37% and 39% and the U.S. rates of 72% and 81%. French rural DOCSIS 3 coverage was 0% in both 2011 and 2012.

As was the case with telephony, French television has long been characterized by strong government influence and slow development. Initially, the French government restricted cable operators to retransmitting over-the-air broadcast signals. It was not until 1982 that the National Cable Plan dissolved the broadcasters' monopoly over video programming. This program, which was fully funded by public money, allowed municipalities to grant monopoly licenses to selected companies, all of which were built by France Télécom. As was the case with telephony, municipalities were expected to help finance the buildout by providing interest-free loans. Water companies, which were able to leverage their relationships with municipal governments, were particularly successful in attracting licenses. The lack of funds caused the cable buildout to proceed very slowly. In 1986, France began to allow greater entry by private firms. France Télécom remained the dominant player until the mid 2000s, when it divested its cable business as well as its investment in major cable companies such as Noos. By 2006, a series of mergers consolidated the vast majority of regional cable companies in the hands of a single company, Numericable. As of February 2014, Numericable had reached 5 million homes and was targeting 8.5 million by 2016.

Despite this consolidation, cable remains a minor player in the French broadband industry. As of September 2013, ADSL was the leading broadband technology (22.4 million subscribers), followed by FTTP (1.4 million subscribers). Cable providers served only 0.5 million NGA subscribers and likely served a significant proportion of the 0.4 million standard broadband subscribers in the category marked "other broadband access," giving it at most 0.9 million subscribers. Interestingly, Numericable's recent presentations of its financial results clearly indicate that it is focusing on FTTP for future growth. Its FTTP-oriented strategy is likely to increase following completion of its acquisition of telephone provider SFR announced in April 2014.

FTTP

Despite all of the emphasis placed on FTTP, French FTTP coverage has continued to lag well behind the rest of Europe. FTTP coverage was 4% in 2011 and 7% in 2012, which fell far short of the EU benchmarks of 10% and 12% and the U.S. benchmarks of 17% and 23%. French rural FTTP increased from 0% in 2011 to a mere 0.6% in 2012. Again, these fell short of EU coverage levels of 0% and 3% and U.S. coverage levels of 6% and 8%.

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This legacy of top-down planning caused French telephone coverage lagged behind the rest of Europe well into the 1970s and is reflected in the well-known state-run Internet forerunner known as Minitel.

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FTTP has performed poorly in France despite the fact that it has long been the target of government subsidies. Perhaps the most controversial example is THD92, the FTTH subsidy program for Hauts-de-Seine targeted at one of the wealthiest suburban Paris departments, which already had a healthy broadband infrastructure. Initiated by Nicolas Sarkozy in 2004 when he was President of the Hauts-de-Seine's General Council, the project became bogged down in litigation when competitors challenged the €59 million subsidy as a violation of the EU's prohibition of state aid. The EU rejected these challenges in September 2009 and September 2013, and the project was finally permitted to proceed.

The French government continued to endorse FTTP in its public pronouncements. In February 2010, President Sarkozy announced France's "National Investment Program," which promised €4.5 billion for the digital economy including €2 billion to promote FTTP. The government set the goal of providing 70% of the French population with access to fiber by 2020 and 100% by 2025. The estimated cost was around €25–€30 billion. Because of the lack of political support, these funds were never allocated.

In February 2013, shortly after the European Union announced that it was reducing its Connecting Europe

Facility from €9 billion to €1 billion, President Holland committed €3 billion in public funding (with an additional €3 billion to come from local governments) and €20 billion in public loans to provide 30 Mbps service to the entire country by 2022 and half the country by 2017, with FTTP being the primary means for doing so. Government officials continued to assert that FTTP represented the best technology for the future.

The companies have signaled some degree of commitment to FTTP. For example, in 2010, Orange resumed fiber deployments in several cities and in July 2011 announced that it would move outside what the French government has classified as "very dense areas," spending €2 billion to cover 60% of French households by 2020. Orange reaffirmed that commitment in 2013. New entrant Free began offering service in 2008, although many regard its efforts at providing FTTH to be somewhat disappointing. In addition, Orange, Free, and SFR entered into agreements in 2011 to share FTTH infrastructure in low-density areas.

Unfortunately, the rhetoric far outstripped actual performance. Despite the ambitious plans, to date French FTTP coverage remains quite disappointing. Given the high cost of FTTP and the needs to extend coverage to more French citizens, Orange has already signaled its preference for shifting away from an FTTP-oriented strategy, and industry analysts predict that the financial realities make such a shift quite likely. ARCEP's FTTDP consultation may ultimately prove to be the means for effecting a change in emphasis away from FTTP.

LTE

French deployment of LTE has also lagged well behind the rest of Europe. French LTE coverage was 0% in 2011 and 6% in 2012. This falls far short of the EU benchmarks of 8% and 27% and the U.S. benchmarks of 68% and 86%. French rural LTE coverage was nonexistent at 0% in both 2011 and 2012.

The reasons for the late deployment of LTE in France are myriad. As an initial matter, France did not allocate the 2.6 GHz spectrum until September 2011, which was later than countries that achieved higher LTE penetration. Even more problematic is the relatively limited coverage of French providers' third-generation HSPA+ networks. Only the second leading provider, Vivendi-owned SFR, has nearly global coverage at 98% of the population. In contrast, the HSPA+ coverage of market leader Orange was only 60% as of the end of 2012.

The HSPA+ coverage of the number three provider, Bouygues, was even lower at 50%. As a result, the market leaders initially placed greater emphasis on upgrading their third-generation networks than on building out LTE.

As a result, French providers did not initiate LTE trials until June 2012, and Orange and SFR did not offer commercial LTE service until November 2012. Although Bouygues did not enter until October 2013, several months after the market leaders, it offered the greatest coverage, due in part to the French regulator's March 2013 decision to allow Bouygues to reallocate its 1.8 GHz spectrum designated for GSM to LTE so long as it divested part of that spectrum to new entrants. As a result, Bouygues covered 63% of the population as of its October 2013 launch and claimed 69% coverage as of March 2014. Neither Orange nor SFR have requested permission to refarm their 1.8 GHz spectrum, opting instead to operate LTE exclusively in the 2.6 GHz band. As a result, the LTE coverage provided by both companies is more limited than Bouygues's, with each carrier covering only 40% of the population as of the end of 2013. Bouygues's strategy also benefits from the fact that the iPhone operates in the 1.8 GHz band and does not support service in the 2.6 GHz band. Bouygues also plans to launch LTE Advanced in June 2014.

Free Mobile launched its long awaited LTE service in the 2.6 GHz band in December 2013. Free Mobile's coverage remains more limited, although the company has not yet revealed any specific statistics about the extent of its network coverage. Free Mobile does compete aggressively on price, including LTE service in its existing 3G plans without any additional charge.

Orange and SFR have begun experimenting with LTE Advanced, which would allow them to combine spectrum across multiple bands.

In December 2012, the government auctioned the 800 MHz portion of the digital dividend. Each 800 MHz licensee was subject to an obligation to cover 98% of the population in mainland France within 12 years from license issued, and 99%+ within 15 years. In this auction, only three of the country's operators acquired spectrum, Free failed to win any blocks at all. Instead, it was given the option of sharing SFR's network.

The market is still undergoing change. In April 2014, Numericable won a bidding war with Bouygues to acquire SFR. In the aftermath, Bouygues and Free are rumored to be in merger negotiations.

* * *

On close analysis, claims about France as a leader in Internet service do not hold up. NGA coverage is languishing at half the EU rate and well behind the U.S. Rural NGA and LTE coverage are virtually nonexistent. These poor results undermine claims that the French approach that centers on strong government intervention and mandated infrastructure sharing and emphasizes FTTP is something that should be emulated. Indeed, ARCEP's recent approval of VDSL and ongoing proceeding on VDSL2 may indicate that France may be preparing to place less emphasis on FTTP and more emphasis on VDSL.

4.1.3 Italy

The third study country with weak facilities-based competition from cable is Italy. Italy is one of the largest countries in Europe, with a high level of urbanization and per capita GDP in line with the rest of Europe. It was also an early leader in deploying FTTP.

That said, Italy's NGA deployment is disappointing, with only 11% NGA coverage in 2011 and 14% NGA coverage in 2012 despite the country's early leadership position in FTTP. These NGA coverage rates are by far the worst in Europe and far below the EU benchmarks of 48% and 54% and U.S. coverage rates of 73% and 82%. Rural NGA coverage rates are 0% for both 2011 and 2012, far below EU rates of 9% and 12% and U.S. rates of 38% and 48%. Subscription prices are also high, and download speeds and total bandwidth consumption are low.

... Italy's NGA deployment is disappointing,
... despite the country's early leadership
position in FTTP.

The government's efforts to promote broadband coverage have been largely unsuccessful. For example, in March 2003, the government established a "Program for the Development of Broadband in the South" allocating €2 billion over a five-year period to close the existing gap in broadband infrastructure between the north and south of Italy. By August 2013, the company

	Total NGA	Rural NGA	DOCSIS 3 cable	VDSL	FTTP	LTE	Pct. DSL shared
Italy	14%	0%	0%	5%	12%	17%	47%
Europe	54%	12%	39%	25%	12%	27%	46%
U.S.	82%	48%	81%	10%	23%	86%	n/a

	Investment per HH	Price 12-30 Mbps	Avg. speed Mbps	Bandwidth per user	Rural HHs	Population density	GDP per capita
Italy	\$291	\$34.96	4.0	12	13%	198	101
Europe	\$244	\$27.64	5.7	18	15%	116	100
U.S.	\$562	\$28.76	7.4	27	19%	34	152

charged with overseeing these funds had invested only €329 million.

Similarly, in 2009, the Italian Ministry for the Economic Development (MISE) developed a “National Broadband Plan” aimed at providing the entire Italian population the opportunity to access broadband service providing download speeds of at least 2 Mbps by the end of 2013. The total budget for period 2009–2012 was initially set for €1.5 billion, but was later cut to €1.1 billion.

Finally, in 2012, the Italian Government defined the Italian Digital Agenda (*Agenda Digitale Italiana – ADI*), translating the goals identified by the Digital Agenda for Europe to the national level. With regards to NGA, the Strategic Project for Ultra-broadband (*Piano Strategico Banda Ultralarga*) was intended to help Italy to achieve the European objective of broadband coverage at a speed of not less than 30 Mbps with at least 50% of households having access to broadband at a speed of at least 100 Mbps by 2020. The first step aimed to bring ultrabroadband to the 15 biggest Italian cities (roughly 17% of the population) within 5 years, investing about €2.5 billion. The second step focused on covering all cities with more than 20,000 people (roughly 50% of the population) at a cost of about €8.5 billion.

These investments would receive both public and private financing, with public interventions initially focused on those areas of market failure in the southern regions of Italy where current providers have found service to be uneconomical (Basilicata, Calabria,

Campania, Molise, Sicily), although other regions could participate in 2014–2020. The Italian Cohesion Action Plan (*Piano Azione Coesione – PAC*), organized in conjunction with the European Commission in 2011, has directed €383 million in funding (co-financed by the EU) towards this end.

Italian regions and autonomous provinces play a central role in achieving the objectives set out in the Digital Agenda. Almost all have initiated plans to ensure wider 8 Mbps coverage, usually integrated by agreements with the Ministry of Economic Development. For example, in 2011 Lombardy planned to deploy ultra-broadband networks to cover 50% of its population, investing €1.1–€1.5 billion within 5–7 years, while Trentino Alto Adige already bridged the digital divide before the end of 2013.

In early 2013, the Ministry of Economic Development announced its intent to launch three calls for tenders, for a total of €900 million (including €237 million in private co-financing) in order to fulfill the objectives of the Broadband Action Plan and the first phase of the Strategic Project for Ultra-broadband.

VDSL

Italian VDSL coverage has been very low, reaching 0% of Italian households in 2011, rising to 5% in 2012, well below the EU benchmarks of 19% and 25%. Signs

indicate, however, that VDSL may be becoming the centerpiece of Italian broadband strategy.

Although Italian companies initially showed interest in FTTP, their focus in recent years has shifted to VDSL. As discussed in greater detail below, new entrant Fastweb abandoned FTTH in favor of a VDSL-based strategy in 2005. Telecom Italia experimented with VDSL2 as early as 2007 and conducted trials through a service known as Alice Phibra.

Moreover, in February 2012, following the collapse of the 2010 proposal for FTTH infrastructure sharing advanced by FTTH pioneer Fastweb, Vodafone, and Wind, Telecom Italia and Fastweb announced a collaboration to use VDSL2 as the last segment in an FTTC architecture. The project sought to provide 100 cities (20% of the population) with theoretical download speeds of 400 Mbps by 2014.

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Italian VDSL coverage has been very low, reaching 0% of Italian households in 2011, rising to 5% in 2012, well below the EU benchmarks of 19% and 25%.

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In September 2012, Fastweb announced its commitment to expanding NGA access by investing an additional €400 million in VDSL infrastructure, which is expected to extend 100 Mbps service to 20% (5.5 million) of Italian homes and firms by the end of 2014. In March 2013, Fastweb launched its VDSL service, extending its VDSL network to 1.5 million homes and enterprises in 14 cities.

In December 2012 Telecom Italia began offering *Ultra Internet Fibra Ottica* at 30 Mbps in three cities: Rome, Turin, and Naples. In June 2013, Telecom Italia obtained regulatory approval to launch VDSL2 nationwide, targeting 6.1 million homes in 100 cities by 2014. All of Telecom Italia's recent corporate presentations confirm that its primary focus is now on VDSL.

DOCSIS 3

In Italy, DOCSIS 3 is nonexistent, covering 0% of the country in both 2011 and 2012. This is necessarily well below the EU benchmarks of 37% and 39% and the U.S. benchmarks of 72% and 81%.

The total absence of cable television is the result of two statutes: a 1936 fascist-era postal statute requiring authorization of the state before anyone can conduct wire-based communications and a 1954 enactment giving public broadcaster RAI (*Radio Audizioni Italiane*) a monopoly over television broadcasting. The success of cable television in other countries during the 1970s prompted some private entrepreneurs to test the limits of these restrictions. Noting that RAI's monopoly extended only to broadcast television and that the postal law did not mention cable television specifically, these entrepreneurs created local cable operations. The government regarded these systems as a threat to public television and in 1973 formally extended RAI's monopoly to all forms of television regardless of the means of transmission. The Italian Constitutional Court declared that action unconstitutional the following year.

Even though the court decision legalized cable, cable operators were still subject to strict and onerous obligations, such as being limited to a single urban area unless the served population was less than 150,000 inhabitants. More importantly, each cable system infrastructure could carry only one channel from the same broadcaster. These regulations limited cable operators' ability to compete with over-the-air broadcasters. Thus, when television services were fully liberalized at local and national level during the 1980s, the Italian cable infrastructure had still not yet developed.

In 1995, Telecom Italia launched Project Socrates (*Progetto Socrate*), which was intended to bring a hybrid fiber coaxial network to 19 Italian cities at a cost of 13 trillion lire (~\$8 billion), of which only 5 trillion lire (~\$3 billion) was actually spent to cover roughly 2 million homes. The program was abandoned in 1997 due to prohibitive cost, concerns about permitting Telecom Italia to establish what would amount to a monopoly over multichannel video, and a change in leadership following the privatization of Telecom Italia.

The absence of cable encouraged the Italian government to use the digital video transition to experiment with an ultimately unsuccessful attempt to generate a broadband alternative to ADSL. Rather than turning to FTTP or cable broadband, the government attempted to promote Digital Video Broadcasting-Terrestrial (DVB-T) as a platform for distributing text, news, weather, text messaging, and other interactive services. The

government pledged to develop e-government services by means of DVB-T, which it called “t-government.” It also provided a €220 million subsidy in 2004 and 2005 for the set-top boxes needed for DVB-T.

The effort was largely unsuccessful. Ten years later, t-government services still had not yet appeared, and Italians used DVB-T only to watch television, with the only pay-per-view and interactive services being offered by Mediaset, controlled by the family of Prime Minister Silvio Berlusconi. Decoders with a smart-card slot for interactive services were eligible for grants. However, the European Commission, the General Court of the European Union, and the Court of Justice of the European Union ruled that the government grants to subsidize the purchase of these DVB-T decoder boxes constituted unlawful state aid. This dalliance with DVB-T further forestalled the possibility that cable networks would emerge as an alternative source of NGA.

FTTP

Italy was an earlier leader in FTTP having begun to deploy FTTP during the 1990s. The country would soon abandon this strategy, and its initial advantage eroded over time. As of 2011, Italy’s 11% national FTTP coverage only slightly exceeded the 10% coverage levels of the overall EU. By 2012, Italy’s 11.8% coverage rates slightly trailed the EU coverage rate of 12.3%. As with other technologies, Italy’s rural coverage remained at 0% as of the end of 2012.

The leading Italian FTTP pioneer was Fastweb. In 1999, Fastweb began providing FTTP in Milan, utilizing some of the resources initially built for Project Socrates. The initial plan was to spend \$6 billion to build a nationwide FTTP network, with a primary emphasis on business customers. By 2002, Fastweb finished the buildout of Milan and began operations in Rome, Genoa, Turin, Naples, and Bologna. After offering FTTP to 2 million homes (representing 10% of the Italian population) and years of unprofitable operations, the company pared back its buildout plans, limiting its fiber rollout to these six large cities and relying on ADSL service provided through local loop unbundling to serve the rest of the country.

In 2005, Fastweb entered a new expansion phase, backed by €800 million in new capital. The new plan sought to reach 10 million homes or 45% of the

Italian population not through FTTP, but rather through a less ambitious VDSL strategy based on fiber-to-the-street-cabinet (FTTS) based on subloop unbundling. Thus, only the 2 million homes representing 10% of the Italian population that Fastweb served during the first phase are served by FTTP. In 2007, Swisscom acquired 82% of Fastweb and acquired the remaining shares in November 2010, after which it took the company private.

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At the present, an FTTH network covering 50% of the Italian population is expected to require capital expenditures of no less than €13 billion.

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In May 2010, Fastweb exhibited renewed interest in FTTP when it joined Vodafone and Wind in submitting a proposal that would have devoted €2.5 billion (\$3 billion) to create a shared FTTP network in 15 Italian cities. Telecom Italia countered with a €7 billion (\$9 billion) plan to extend FTTP to six cities by end of 2010 and expand it to 13 cities by the end of 2012 and 138 cities (50% of the population) by 2018. Fastweb and its partners withdrew their proposal the following September after Telecom Italia’s repeated disavowals of any interest in participating in a shared FTTP infrastructure and because of its belief that the advisory committee created by the Italian regulator (AGCOM) to facilitate NGA deployments was favoring the incumbent. Telecom Italia also did not proceed with its plans. Fastweb’s subsequent expansion plans to cover 50% of the Italian population have been based on FTTS. Even with the advantage of obtaining resources from Project Socrates at a discount, Fastweb has operated at a loss every year except for one.

At the present, an FTTH network covering 50% of the Italian population is expected to require capital expenditures of no less than €13 billion. Telecom Italia has begun to show renewed interest in FTTP, but only on a limited basis. In January 2012, it received regulatory approval to begin deploying FTTP subject to certain conditions. Specifically, in cities where a competing FTTP exists, Telecom Italia must limit its operations to 40,000 subscribers and must offer competitors access to its network on an unbundled or wholesale basis. The company rolled out FTTH in

Milan in June 2013, reaching around 455,000 homes and scheduled to reach 564,000 homes by 2015. In November 2013, Telecom Italia announced a strategic action plan for 2014 to 2016, committing €1.8 billion for FTTP. This minor investment is widely regarded as a token gesture towards FTTP, and the major providers remain focused primarily on VDSL. In May 2012, the Fondo Strategico Italiano (Italian Strategic Fund) announced that it would invest in up to €500 million in FTTP provider Metroweb to bring FTTP to the thirty largest Italian cities. In the meantime, the ambitious FTTH projects launched by regional governments, such as the one in Lombardy, appear to have ground to a halt.

Thus, even though Italy was once an FTTP leader and has long favored FTTP over VDSL, it appears to be shifting towards emphasizing VDSL. The low current levels of NGA coverage argues strongly in favor of such a move.

LTE

Italy's deployment of LTE began relatively late, but coverage substantially improved during 2012. LTE coverage was 0% as of the end of 2011, but reached 17% by the end of 2012. This impressive achievement closed the gap with EU benchmarks of 8% and 27%, but still trailed U.S. benchmarks of 68% and 86%. Rural LTE coverage remained at 0%, however.

Italy completed its 4G auction in September 2011, encompassing both the 800 MHz and 2.6 GHz spectrum as well as spectrum in the 1.8 GHz band. (A block in the 2.0 GHz band failed to sell.) Vodafone began offering LTE service in the 1.8 GHz in October 2012, followed by Telecom Italia Mobile and 3 Italy in November 2012.

Italy's LTE coverage has improved still further since the end of 2012. Telecom Italia Mobile's LTE network now covers 384 municipalities, representing 41% of the population. Vodafone's network is more limited, covering only 46 of the most important Italian cities and tourist locations. Both companies intend to cover 90% of the population in 2017, and Telecom Italia Mobile aims at reaching 60% of the population by the end of 2014. 3 Italia currently covers only Rome and Milan, but has the goal of covering all of the provincial capitals by the end of 2014. Wind is lagging even farther behind, as its 4G network only covers some areas of Rome and Milan.

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All in all, despite promising early efforts in FTTP, Italian broadband policy must be considered something of a disappointment. As far as January 2014, the objective of ensuring that all Italian citizens had access to standard broadband by the end of 2013 was not achieved. Indeed, standard broadband (defined as 144 kbps) was available in only 91% of rural areas. NGA coverage has lagged even farther behind. Hopefully, the Italian government's most recent subsidy program will help close the gap.

On a more general note, countries that relied on FTTP in the absence of strong cable competition appear to have performed worse than Europe as a whole. The weak performance of these countries on key metrics raises serious questions as to whether the reputations that Sweden and France enjoy as Internet leaders are fully deserved.

Moreover, both Italy and France appear to be considering shifting focus away from FTTP and towards VDSL as a more cost-effective way to achieve the Digital Agenda goals established by the European Commission. One industry analyst usefully frames the decision between VDSL and FTTP as a choice between speed and coverage: "Is it better to provide 75–100 Mbps to 80–90 percent of the population or 1 Gbps to 10–20 percent of the population? Especially when that 10–20 percent is already enjoying faster speeds than the rest" (Broadband Trends 2013).

This is not to say that FTTP does not have an important role in a broadband deployment strategy. Where new infrastructure is being deployed, FTTP represents the best long-term option. These results do suggest that VDSL and DOCSIS 3 also play important roles, either as bridge technologies that allow fiber to be deployed ever deeper into the network or as ways to serve rural areas that lack sufficient population density to support FTTP. In short, rather than favoring any one technology, as France did when promoting FTTP to the exclusion of VDSL, these data suggest that policymakers should seriously consider a balanced strategy that takes the unique legacy and circumstances of each country into account.

4.2 Strong Competition from Cable and FTTP over VDSL

Two other countries whose telephone companies also pursued FTTP over VDSL strategies faced strong competition from cable broadband. Both of these countries exhibited NGA coverage levels that exceeded that of the EU. They were also characterized by DSL sharing levels that fell below EU averages, underscoring the importance of facilities-based competition over service-based competition.

4.2.1 Denmark

Denmark represents an NGA success story, underservedly overshadowed by its more celebrated neighbor to the north. NGA coverage reached 62% in 2011 and 73% in 2012, well above the EU benchmarks of 48% and 53%, but slightly below the U.S. benchmarks of 72% and 81%. In addition, Denmark enjoyed strong LTE coverage of 54% in 2011 and 61% in 2012, significantly higher than the EU coverage levels of 8% and 27%, although again short of U.S. coverage levels of 68% and 86%. Denmark also enjoyed strong download speeds, low prices, and healthy investment rates.

The only blemish is with respect to rural NGA coverage, which languished at 0% in 2011 and 3% in 2012, below EU levels of 9% and 12% and well

behind U.S. levels of 38% and 48%. Despite the strong nationwide coverage levels for LTE, rural LTE coverage was only 1% in 2011 and 2% in 2012.

Denmark also has an unusual market structure in that the incumbent telephone provider is also the owner of the leading cable provider, a situation that was rectified in other countries. Denmark is also the only country in the study to see a new entrant to become the market leader in FTTP instead of the incumbent. Aside from some early support for cable and some minor initiatives in municipal broadband, Denmark has largely eschewed public subsidies.

VDSL

VDSL covered only 2% of the country in 2011, before surging to 21% in 2012, reaching levels close to the EU benchmark of 25%. Rural VDSL service was 0% in both years, in contrast to the 3% and 5% coverage achieved in the EU as a whole.

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Aside from some early support for cable and some minor initiatives in municipal broadband, Denmark has largely eschewed public subsidies.

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	Total NGA	Rural NGA	DOCSIS 3 cable	VDSL	FTTP	LTE	Pct. DSL shared
Denmark	73%	3%	61%	21%	43%	65%	25%
Europe	54%	12%	39%	25%	12%	27%	46%
U.S.	82%	48%	81%	10%	23%	86%	n/a

	Investment per HH	Price 12-30 Mbps	Avg. speed Mbps	Bandwidth per user	Rural HHs	Population density	GDP per capita
Denmark	\$457	\$23.40	7.0	n/a	17%	130	126
Europe	\$244	\$27.64	5.7	18	15%	116	100
U.S.	\$562	\$28.76	7.4	27	19%	34	152

As was the case in most European countries, telephone service in Denmark began as a state-owned monopoly, but unlike many other countries, the initial providers were small regional telephone companies instead of a national PTT. In 1990, the Danish Parliament enacted legislation authorizing these small regional companies to merge in order to help compete against other international telecommunications providers. A holding company known as Tele Danmark (later known as TDC) acquired these companies and consolidated their operations in 1995. The government began the process of privatizing TDC in 1994, and the company became completely private in 1998. TDC was subsequently acquired by a series of private equity firms, although that does not seem to have adversely affected the company's willingness to invest.

structure, and both appear to be focusing more on wireless broadband than on competing for fixed-line customers.

The fact that TDC provided both DSL and cable modem service appears to have led it to emphasize cable modem service over both VDSL and FTTP. Indeed, in 2009, it stopped marketing its 50 Mbps VDSL service in favor of a triple-play service based around its 20 Mbps cable product. In recent years, TDC has begun to show greater interest in VDSL, emphasizing the potential of vectoring and remote DSLAMs in its annual reports. In addition, because vectoring is inconsistent with unbundling, the Danish regulator relieved TDC of unbundling obligations in areas where it has upgraded its VDSL network to use vectoring, opting instead for a wholesale access requirement.

Although there were some early experiments with cable television during the late 1950s and 1960s, the industry did not take off as a technology until 1985, when the government authorized the four then-regional telephone companies to enter the cable market and provided some funding to enable them to do so.

DOCSIS

DOCSIS 3 contributed more than any other technology to Denmark's strong NGA coverage. DOCSIS 3 was available in 54% of Danish households in 2011 and 61% of Danish households in 2012. These coverage levels were significantly higher than the EU benchmarks of 37% and 39%, but below U.S. benchmarks of 72% and 81%. In rural areas, however, Danish DOCSIS 3 coverage was a disappointing 0% in both 2011 and 2012, trailing EU rural coverage levels of 4% and 6% and well behind U.S. rural coverage levels of 37% and 40%.

TDC was not the first provider to deploy DSL, largely out of concern that DSL would cannibalize TDC's ISDN business. Instead, DSL was first offered by a new entrant known as Cybercity in 1999, which was later acquired by Telenor, establishing a recurring pattern in Danish telecommunications. TDC soon followed in 2000, and soon three roughly evenly sized companies shared the market. Over time, TDC became the dominant DSL provider, in no small part from its practice of acquiring companies that successfully employed local loop unbundling to establish service (such as Fullrate and A+ in 2010). As of the end of 2012, TDC controlled 74% of the DSL market, well above the levels of the typical European incumbents and only trailing the levels of the incumbents in Cyprus and Luxembourg.

TDC's only significant competitors are Telenor, the Norwegian incumbent, and Telia Sonera, the company formed by the merger of the Swedish and Finnish incumbents. Neither provider owns any copper infra-

Although there were some early experiments with cable television during the late 1950s and 1960s, the industry did not take off as a technology until 1985, when the government authorized the four then-regional telephone companies to enter the cable market and provided some funding to enable them to do so. The goal was to form a hybrid network that would provide radio and video programming to private households as well as high-speed data to private companies and public institutions.

As a platform for distributing video programming, the initiative was a rousing success, with Denmark enjoying the highest level of cable television subscribership in the world. As a platform for high-speed data, the hybrid network was essentially a failure. When TDC integrated the regional companies into a single operation in 1995, it shut down the hybrid network and integrated it into a single national cable television network known as Tele Danmark Kabel TV. Even after NTC acquired

TDC in 2005, it continued to operate TDC Kabel TV as a separate company and renamed it YouSee in 2007 to emphasize its independence.

TDC remains the largest cable television operator, offering service to 1.5 million (56%) of Danish households and providing service to 1.2 million (46%) Danish households. Stofa is the second largest provider of cable, with 414,000 subscribers as of 2011. Stofa's service area focuses on Jutland and Funen. The lack of overlap with TDC's cable network means that for the most part the two companies do not compete directly. Stofa, which was acquired by Telia in 1995, first offered cable modem service in 1996. TDC began providing broadband service in 1999, half a year after ADSL. By 2003, most of the cable infrastructure was upgraded to provide broadband services. Cable modem service is now available in 63% of Danish households, with the vast majority (62% of households) having already been upgraded to DOCSIS 3. Interestingly, in 2012, Stofa was acquired by energy company Syd Energi (SE), which is also a major provider of FTTP.

One of the most striking aspects of Danish broadband is that the telephone system and the cable system are both owned by TDC, which controls 74% of the DSL market and 66% of the cable modem market. This led the Danish NRA in 2009 to order TDC to open its cable broadband infrastructure to other operators. As a general matter, the European Commission does not recommend including fiber and cable broadband networks in the definition of the market for broadband access (market 5). Danish telecommunications legislation does not distinguish between different types of fixed communication networks, however, and thus applies equally to copper, cable, and optical networks. Although eleven other EU countries include cable modem service in the market for broadband access, Denmark is the only country to mandate access to cable broadband systems, although to date no provider has attempted to utilize this right.

FTTP

Denmark also enjoys strong FTTP coverage. As of 2011, FTTP was available in 37% of Danish homes, well over the 10% coverage rate for the EU as a whole and the 17% coverage rate for the U.S. By 2012, Danish FTTP coverage had risen to 43%, well above the EU coverage rate of 27% and the U.S. coverage rate of 23%. Rural FTTP coverage rates were disappointing in Denmark, however, registering at 0% in 2011 and 3% in

2012, which was in line with EU rates, but below U.S. rates of 6% and 8%.

In contrast to other countries that have emphasized fiber, the incumbent TDC has shown little interest in pursuing FTTP. Its annual reports instead emphasize increasing the capacity and speed of its cable modem product and improving DSL through vectoring and making greater use of remote DSLAMs to deploy fiber closer to the home. TDC's November 2009 acquisition of DONG Energy and its 15,000 FTTP customers raised the possibility that it might be preparing to place greater emphasis on FTTP. Subsequent press reports do not find that the acquisition effected any change in TDC's approach.

Instead, the Danish FTTP market is dominated by regional energy companies. Since 2000, energy companies have invested heavily in fiber networks, and their networks now pass 700,000 households. The most important player among the electricity companies is Syd Energi (SE), the electricity provider in South Jutland. This region is one of the least densely populated regions in Denmark, but due to SE, it nonetheless enjoys the best FTTP coverage in the nation. As noted above, in 2012, SE acquired Stofa, Denmark's second largest cable company and the only cable provider in Jutland. In addition, in September 2010, fourteen energy companies formed Wao! in order to promote broadband via FTTP.

Unfortunately, these energy companies' large investments in FTTP have not been financially successful, losing DKK 5.3 billion (€700 million) on these activities through 2012. As a result, the energy companies have scaled back further investments in the aftermath

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of the 2008 economic downturn and have focused instead on connecting more customers to the existing infrastructure.

Thus, Denmark's strong FFTP coverage is the product of private investment by a facilities-based entrant, in stark contrast to the government subsidies used in Sweden. Unfortunately, to date the financial performance of these services has been disappointing. Even so, since June 2011, TDC has received some requests to open its FFTP network to other operators and service providers. Any household within 30 meters of TDC's optical network can request access regardless of whether they are a TDC customer or not. The costs of connection, which are estimated to be around €2,000, must be borne by TDC even if the customer wants to subscribe to a competing operator.

LTE

Denmark is one of the stronger LTE countries in Europe, achieving 54% national coverage by the end of 2011 and 65% national coverage by the end of 2012, well ahead of the EU levels of 8% and 27% respectively, but behind the U.S. levels of 68% and 86%. Rural coverage has been more disappointing, with LTE reaching only 1% of Danish rural households by the end of 2011 and 2% of Danish rural households by the end of 2012, as compared with EU coverage levels of 5% and 10%.

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The fact that the 7% increase in DOCSIS 3 coverage and the 6% increase in FFTP coverage both contributed to the 11% increase in NGA coverage suggests that the bulk of these investments do not overlap and thus are not driven by competitive forces.

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Denmark completed its auction of the 2.6 GHz on May 6, 2010, which among the countries studied in this study trailed only Sweden. The early 2.6 GHz auctions permitted Denmark to enjoy the widespread early deployment of LTE. Telia launched LTE service in December 2010, relying on the 2.6 GHz band and reaching 75% coverage by May 2013. TDC launched

LTE in October 2011, again relying on the 2.6 GHz band. TDC's LTE network covered 40% of the Danish population by the end of 2012 and is forecast to cover 99% of the population by the end of 2015.

In addition, the Danish regulator, the National IT and Telecom Agency (NITA), decided in December 2009 to permit providers to reallocate 900 MHz and 1.8 GHz spectrum from GSM to LTE. NITA did so notwithstanding the EU's initial preference for deploying LTE in the 800 MHz spectrum or in the 2.6 GHz flexible spectrum, although in 2011 the EU directed member states to permit LTE operations in the 1.8 GHz spectrum in an attempt to promote roaming through harmonization. NITA did require Telia to divest spectrum in both bands and also required TDC to reduce its spectrum holdings in the 1.8 GHz band. The recovered spectrum was refarmed into a 2x5 MHz block in the 900 spectrum and a 2x10 MHz block in the 1.8 GHz spectrum. In October 2010, these blocks were sold at an auction at which incumbents were not allowed to bid and at which 3 Denmark was the only participant.

In June 2011, Telia and Norwegian incumbent Telenor entered into an infrastructure-sharing joint venture called TT-Netværket, which was approved by Danish regulators in March 2012. The flexibility provided by the Danish regulator to provide LTE service in the 1.8 GHz band permitted Telenor to use the TT-Netværket infrastructure to launch LTE service in Denmark in March 2013. Moreover, at launch, Telenor was able to cover 75% of the Danish population, which allowed it to leapfrog over the coverage provided by TDC. Telia was also able to expand its LTE service to include both the 1.8 GHz and 2.6 GHz bands.

In June 2012, Denmark allocated more spectrum to LTE when it completed its digital dividend auction of 800 MHz spectrum. TDC acquired a 2x20 MHz license, which is widely regarded as the optimal block size for implementing LTE. TT-Netværket acquired 2x10 MHz licenses which can be used to reach an estimated 98% of the population. These licenses carry no rural coverage requirements, although they are subject to tower-siting restrictions to prevent interference with television broadcasting. Both 800 MHz licensees must cover 99% of the Danish population with 10 Mbps service.

Denmark's fourth wireless provider, 3 Denmark, missed out in its bid for 800 MHz spectrum. However, in September 2012, it launched its 4G network across fifteen of Denmark's largest cities, covering 38% of the population using a combination of 1.8 GHz and 2.6

GHz spectrum at launch and later expanding its coverage to 75% of the population by the end of 2013. Because Apple's iPhone 5 LTE operates only in the 1.8 GHz band, it is compatible with Telia, Telenor and 3 Denmark, but not TDC.

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The precise bases for Denmark's success are hard to unravel. On the one hand, the fact that the incumbent telephone company was also the leading cable broadband provider undercuts the traditional story of facilities-based competition between cable and DSL. On the other hand, the presence of vibrant FTTP-based entry by energy companies raises the possibility of facilities-based competition between cable and FTTP, although to date FTTP has been unprofitable. The fact that the 7% increase in DOCSIS 3 coverage and the 6% increase in FTTP coverage both contributed to the 11% increase in NGA coverage suggests that the bulk of these investments do not overlap and thus are not driven by competitive forces.

In any event, recent years have witnessed a fundamental change in the political discourse about broadband policy. Debates during 2013 witnessed increasing calls for public subsidies, as many became concerned that private companies would not be able to meet the increasing demand for bandwidth. These proposals did not specify how such public funding would be financed.

4.2.2 Spain

That Spain would emerge as an above-average performer in terms of NGA coverage comes as something of a surprise. Not only does Spain have a greater rural population than is generally true in Europe; its GDP per capita (adjusted for purchasing power parity) is slightly below the EU average. Notwithstanding these demographic disadvantages, Spain has achieved high levels of NGA coverage, reaching 56% of households in 2011 and 64% of households in 2012. These coverage levels exceed the NGA coverage levels of 48% and 54% for Europe as a whole, although they fall short of U.S. coverage levels of 73% and 82%.

Rural NGA coverage levels are also respectable by European standards, reaching 7% in 2011 and 13% in 2012 as compared with 9% and 12% EU-wide, although these fall short of U.S. rural NGA coverage of 38% and 48%.

There are some areas for improvement, however. As of 2012, LTE coverage still languished at 0%. Prices remain relatively high, and download speeds, bandwidth usage, and investment levels remain low.

VDSL

To date, VDSL has played a minor role in supporting Spain's impressive NGA coverage numbers. VDSL was available in only 11% of Spanish households in both 2011 and 2012, well below EU coverage levels

	Total NGA	Rural NGA	DOCSIS 3 cable	VDSL	FTTP	LTE	Pct. DSL shared
Spain	64%	13%	50%	11%	18%	0%	41%
Europe	54%	12%	39%	25%	12%	27%	46%
U.S.	82%	48%	81%	10%	23%	86%	n/a

	Investment per HH	Price 12-30 Mbps	Avg. speed Mbps	Bandwidth per user	Rural HHs	Population density	GDP per capita
Spain	\$255	\$47.11	4.9	13	18%	92	96
Europe	\$244	\$27.64	5.7	18	15%	116	100
U.S.	\$562	\$28.76	7.4	27	19%	34	152

of 19% and 25%. Rural VDSL coverage was 0% both years, in contrast to EU rural VDSL coverage rates of 4% and 5%.

DSL service was launched in 1999. Several new entrants took advantage of local loop unbundling to compete with Telefónica, with the leading DSL competitors including Jazztel, Vodafone and Orange. Telefónica launched VDSL2 in April 2008, the earliest launch of any country included in this study. Jazztel followed suit in April 2010, with Telefónica increasing its download speeds from 30 Mbps to 50 Mbps in 2011 and Vodafone launching VDSL2 in May 2013.

The service initially failed to gain traction with subscribers, but over time became an important component of NGA coverage, although not as important as FTTP. A study of NGA technologies by city size conducted by the Spanish regulator revealed that FTTH represented the most important NGA technology in Madrid and Barcelona and had begun expanding in medium-sized cities as well. DOCSIS 3 was the most important technology in medium-sized cities. VDSL played an important role in medium-sized cities and has remained the most important technology in smaller cities (CMT 2013).

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More recently, other providers have begun to show greater interest in FTTP. In June 2012, Orange announced its intention to invest €300 million to bring FTTP to 1.5 million Spanish homes.

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DOCSIS 3

Cable broadband has played the leading role in allowing Spain to achieve its impressive NGA coverage rates. DOCSIS 3 was available in 46% of Spanish households in 2011 and 50% of Spanish households in 2012, well above the EU benchmarks of 37% and 39%, but below the U.S. benchmarks of 72% and 81%. Moreover, DOCSIS 3 was the only NGA technology in Spain that was available in rural areas. Rural DOCSIS 3 coverage was 7% in 2011 and 13% in 2012, versus EU coverage rates of 4% and 6% and U.S. coverage rates of 37% and 39%.

The progress of cable broadband is all the more impressive in light of the fact that private television channels did not exist until 1987 and the Spanish cable television industry did not exist until the mid-1990s. All of this changed in 1998, when the government used a competitive tender process to create thirty-seven new cable operators in different regions of the country. The access to local capital provided by Spanish savings banks and the regional governments' inherent opposition to the central government helped get these fledgling operations off the ground. Because cable television did not develop until relatively late, they were able to deploy modern equipment that was easy to upgrade for more advanced services. To compete with these new pay TV services, Telefónica created Telefónica Cable in 1997, although regulatory and commercial problems led Telefónica to focus its efforts on ADSL and pay television through its satellite-based Via Digital platform.

A series of mergers in 2004 and 2005 consolidated many of the regional cable operators into a single company called ONO, which emerged as the largest cable operator in Spain. On March 17, 2014, ONO announced that it was being acquired by Vodafone. Smaller operators, such as Euskaltel (País Vasco), R (Galicia), and Telecable (Asturias), continue to operate on a regional level.

Cable operators upgraded their networks in 2012 so that 96% of all cable broadband connections belonged to a node updated to DOCSIS 3. As of 2012, ONO controlled 51% of NGA connections, and regional cable operators controlled another 21%, although their cumulative share dropped 9% from the previous year due primarily to the growth of FTTP.

FTTP

Spanish FTTP deployments run at or slightly above the EU average. In 2011, FTTP was available in 10% of Spanish households in 2011 and 18% of Spanish households in 2012. This was compared with EU coverage rates of 10% and 12% and U.S. coverage rates of 17% and 23%. Rural FTTP coverage remains at 0%.

Telefónica has provided FTTP since 2009, but the service did not begin to take off until 2011. As of now, FTTP falls outside the scope of any obligations to provide unbundled or indirect wholesale access, although Telefónica asserts that the overhanging threat of such regulation deters FTTP investments.

More recently, other providers have begun to show greater interest in FTTP. In June 2012, Orange announced its intention to invest €300 million to bring FTTP to 1.5 million Spanish homes. The high cost of FTTP has led providers to experiment with higher degrees of cooperation. In October 2012, Telefónica and Jazztel agreed each to deploy fiber to 1.5 million households and to provide each other with reciprocal access to the interior wiring needed to reach those customers. Jazztel anticipates that the project will cost €590 million, with €450 million coming from Chinese investors and the rest from the European Investment Bank. Orange and Vodafone reached a similar agreement shortly thereafter, committing to extend FTTP to 6 million households at a cost of €1 billion. The parties have submitted these agreements to CMT for review.

A recent CMT study of NGA deployments based on city size has also raised questions about FTTP's potential in smaller Spanish cities. Limited public funding (€333 million) is being used to support initiatives such as Asturcon, which is designed to bring FTTP to the economically disadvantaged principality of Asturias.

LTE

Spain got off to a late start in LTE deployments, having 0% LTE coverage as of the end of 2012 despite the fact that it auctioned both its 800 MHz and 2.6 GHz spectrum in July 2011. Although this satisfied the EC's requirement that the spectrum be allocated by January 1, 2013, Spain nonetheless invoked the exception permitting states to postpone the deadline until 2015 under exceptional circumstances. Following a change in the government in November 2011, the new administration committed to release the digital dividend frequencies by January 1, 2014. However, a December 2012 Supreme Court decision invalidated the new digital television channel assignments for their failure to comply with the Audiovisual Communication General Act. This cast doubt on whether the 800 MHz frequencies would in fact be available in January 2014.

Spanish law nonetheless gave mobile providers the flexibility to deploy LTE in other frequency plans. Rather than wait for these issues to be resolved, mobile providers initiated LTE service in the 1.8 and 2.6 GHz frequency bands. By July 2013, Vodafone, Orange, and Yoigo had deployed LTE, with Movistar following suit in September 2013.

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Spain's ability to achieve such strong NGA coverage in light of its demographic characteristics and the weak legacy of cable television is impressive. Spain is a good example of a country where cable made the primary contribution to NGA coverage, but the increase from 2011 to 2012 was driven primarily by FTTP. The Spanish regulator has raised the possibility that VDSL may play an important role in smaller metropolitan areas.

4.3 Strong Competition from Cable and VDSL over FTTP

Three other countries faced strong competition from cable, but unlike the other five countries in this study chose to emphasize VDSL over FTTP. All three of these countries exceeded the EU benchmark for NGA coverage. Indeed, at 98% NGA coverage, the Netherlands enjoyed the second highest level of NGA deployment in the EU.

4.3.1 Netherlands

European broadband success stories typically do not mention the Netherlands, but they should. Netherlands is one of Europe's leaders in NGA coverage, second only to Malta. NGA was available in 97% of Dutch households in 2011 and 98% of Dutch households in 2012. The Netherlands thus far exceeded the EU benchmarks of 48% and 54% and was the only country in this study to surpass the U.S. benchmarks of 73% and 82%. Dutch rural NGA coverage was also outstanding, serving 73% of Dutch homes in 2011 and 85% in 2012, well above the EU levels of 9% and 12% and exceeding the U.S. levels of 38% and 48%. The Netherlands also enjoys healthy investment, good prices, and strong download speeds. The only area where the Netherlands lags is LTE, which had not deployed as of the end of 2012.

The Netherlands also enjoys healthy investment, good prices, and strong download speeds. The only area where the Netherlands lags is LTE, which had not deployed as of the end of 2012.

Perhaps the Netherlands strong NGA coverage comes as no surprise, since the Netherlands has the lowest percentage of rural households of any country in this study, a strong per capita GDP, and a relatively flat topography. What is most striking is that the Netherlands was able to achieve such high coverage rates without significant contributions from FTTP. Instead, competition from cable is credited in spurring the incumbent KPN to invest in VDSL (Analysis Mason 2013).

VDSL

VDSL played an important contributing role in promoting Dutch NGA coverage. In 2011, VDSL covered 47% of all Dutch households, and that number increased to 60% in 2012. These coverage rates far exceeded the EU coverage rates of 19% in 2011 and 25% in 2012. Rural VDSL rates check in at 28% both years, higher than the EU rates of 19% and 25%.

The fixed line broadband market has long been dominated by DSL technologies provided via the traditional copper local loop of KPN. Kicked off in late 1990s, ADSL rapidly became the market leader, surpassing cable broadband in the early 2000s. After the introduction of ADSL, several alternative providers entered the market using the access network of KPN.

In 2007, these parties began negotiations with KPN about subloop unbundling to support VDSL. The leap to

VDSL and increased competition meant that KPN and new entrant Tele2 were the only substantial facilities-based DSL providers in the Netherlands. In August 2009, Tele2 (formerly Versatel) deployed CO-VDSL to launch a 60 Mbps product called “Fiber Speed.” With this approach Tele2 expected to reach out to 1 million households less than 1 kilometer away from the central office by the end of 2010 and eventually reach 2 million homes without having to incur the high cost of FTTP. KPN initiated VDSL2 service in 2009, CO-VDSL in 2010, and VDSL-Outer Ring service in 2011. Vodafone also launched VDSL in 2011. Like Tele2, these companies regard VDSL as a defensive strategy against cable broadband used to postpone the need to invest in FTTP.

DOCSIS 3

DOCSIS 3 represents the dominant NGA technology in the Netherlands. In 2011, DOCSIS 3 was available in 97% of Dutch households, well over EU coverage levels of 36% and even higher than the U.S. coverage level of 72%. By 2012, Dutch DOCSIS 3 coverage had inched up to 98%, while EU coverage remained at 39% and U.S. coverage increased to 81%. Rural DOCSIS 3 coverage was also quite strong at 66% in 2011 and 80% in 2012, compared with 4% and 6% in the EU and 37% and 39% in the U.S.

The Dutch cable industry emerged during the late 1950s and 1960s as a series of community antenna television systems, with larger systems being operated

	Total NGA	Rural NGA	DOCSIS 3 cable	VDSL	FTTP	LTE	Pct. DSL shared
Netherlands	98%	85%	98%	60%	18%	0%	27%
Europe	54%	12%	39%	25%	12%	27%	46%
U.S.	82%	48%	81%	10%	23%	86%	n/a

	Investment per HH	Price 12-30 Mbps	Avg. speed Mbps	Bandwidth per user	Rural HHs	Population density	GDP per capita
Netherlands	\$450	\$23.95	8.6	n/a	8%	495	128
Europe	\$244	\$27.64	5.7	18	15%	116	100
U.S.	\$562	\$28.76	7.4	27	19%	34	152

as part of the PTT. In 1969, the government abandoned plans to unify all of the cable systems under a PTT monopoly and opted instead to license private cable systems that gave preferential rights to the municipalities. Other amendments to the telecommunications statute permitted the incumbent telephone provider to build cable television networks through a subsidiary called CASEMA.

The result was that during the 1970s and 1980s, thousands of small cable networks were built, financed primarily by local municipalities, housing corporations, or third parties often acting on behalf of municipalities and spurred in part by these municipalities' decisions to bar rooftop antennas. By the mid-1990s, cable television covered 94% of Dutch homes. Municipalities generally divested their cable networks following the mandate of liberalization in the late 1990s. This triggered a wave of consolidation that ultimately created two dominant, but nonoverlapping cable operators, Ziggo and Liberty Media-owned UPC. Together these companies serve close to 90% of all cable subscribers. Liberty Media is in the process of acquiring Ziggo. The transaction is subject to approval by the European competition authority, which may require remedies including access obligations.

During the merger wave of the 1990s and 2000s, cable companies continued to invest in keeping their networks technologically up to date, which left Dutch cable operators well positioned to roll out broadband Internet services. These companies first deployed cable broadband during the late 1990s using proprietary technologies, but later switched to DOCSIS during the early 2000s. These companies have subsequently upgraded their networks to DOCSIS 3.

Despite their near universality, cable broadband networks are not regarded as possessing significant market power and thus remain largely unregulated. During a limited period of time, the regulator considered mandating access to cable facilities, but these decisions were challenged in court and were never implemented. Recently, the Dutch parliament introduced amendments to the Telecommunications Act and to the Media Act that would have mandated wholesale access to the so-called "analogue basic package." However, these provisions have been challenged by the European Commission. A Dutch court annulled the provisions, and the Dutch government has announced that they will withdraw the provisions. This will also end the European case.

FTTP

Despite being one of the leading European nations in terms of NGA coverage, Dutch FTTP coverage is surprisingly pedestrian. In 2011, FTTP was available in 13% of all Dutch households, as compared with 10% coverage for the EU as a whole and 17% coverage for the U.S. By 2012, Dutch FTTP coverage had increased to 18%, while EU coverage increased to 12% and U.S. coverage had increased to 23%. Dutch rural FTTP coverage was 9% in both 2011 and 2012, compared with 0% and 3% for the EU and 6% and 8% for the U.S. In short, Dutch FTTP coverage is nothing more than merely solid despite the presence of well-publicized initiatives such as *Kenniswijk* and Reggefiber.

The Netherlands has a unique fixed line access infrastructure. Thanks to municipal subsidies, it is among the most densely cabled countries in the world, which made two fixed-line connections available in 92% of Dutch homes.

Dutch FTTP began in the early 2000s, as some municipalities and smaller operators began to deploy fiber optic networks in Rotterdam and Amsterdam. In addition, in 2000, the government initiated the *Kenniswijk* (smart city) project in the area around Eindhoven, which provided €9 million in annual funding to promote the rollout of FTTP.

Dutch FTTP deployments received a jolt in the arm in 2005 when a private investor founded Reggefiber. Reggefiber began acquiring small-scale fiber networks, such as a 40,000-subscriber FTTP network in Amsterdam. The company also targeted small and mid-sized cities for rolling out full blown FTTP. Reggefiber leases the fiber connection on a wholesale basis to retail service providers and does not begin construction until at least 30% of households in the targeted area have committed to subscribe to one of the retail service providers. KPN acquired a 41% stake in Reggefiber in December 2009 and increased its stake to 51% in November 2012 and again to 60% in January 2014, which gave it full control over Reggefiber. Approval by the national competition authority is pending.

Because Reggefiber is likely to come under the full control of KPN, its FTTP networks are subject to unbundling and wholesale access obligations. The fact that Reggefiber's business model is wholesale access and the lack of alternative providers has minimized the impact of this obligation.

In 2008, the Communications Infrastructure Fund (CIF), a large investment group largely supported by Dutch pension funds, also became interested in FTTP although it decided to pursue a strategy that is quite different from Reggefiber's. CIF started to acquire the remaining cable connections from independent cable operators, who owned approximately 12.5% of all connections, with the other connections being in the hands of Ziggo and UPC. CIF owns an estimated 60% of these once independent connections. After acquisition, CIF and overbuilds their coaxial networks with FTTP. It then upsells services to promote migration from coaxial cable to fiber with the aim of eventually retiring the coaxial network. Because of this strategy, CIF-based FTTP does not face competition from cable broadband providers. Reggefiber and CIF FTTP deployments tend not to overbuild each other. Despite these efforts, Dutch FTTP coverage remains quite modest, with incumbent KPN continuing to take a balanced approach between VDSL and FTTP.

LTE

The Netherlands was slow to deploy LTE, having 0% LTE coverage in both 2011 and 2012. This, of course, was well below the 2012 EU coverage rate of 27% or the U.S. coverage rate of 86%.

The primary reason for the delay in deploying LTE is that the Netherlands did not auction its 2.6 GHz spectrum until April 2010. The delay was mostly the result of Lower House of the Dutch Parliament's insistence that the auction create new mobile broadband providers by placing spectrum caps on the incumbents. Ironically, only two new entrants entered the auction, and some blocks did not receive any bids. The result was a spectrum allocation that was far from optimal, and the auction generated a disappointing €2.7 million. Ziggo launched LTE service using its 2.6 GHz spectrum in May 2012, but it targeted only the business market.

A December 2012 auction allocated the 800 MHz digital dividend spectrum as well as the 900 MHz and 1.8 GHz spectrum reformed from GSM. Although spectrum was again set aside for newcomers, only one player

entered the wireless market, Tele2, and it in the end decided not to build its own network but instead opted to team up with T-Mobile. All three operators—KPN, Vodafone and T-Mobile—were offering LTE using the 800 MHz or 1.8 GHz spectrum before the end of 2013.

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The Netherlands has a unique fixed line access infrastructure. Thanks to municipal subsidies, it is among the most densely cabled countries in the world, which made two fixed-line connections available in 92% of Dutch homes. Both were more or less government financed/owned. The privatization of these networks resulted in today's market with strong competition between cable television operators and the incumbent KPN that is driving the NGA rollout. Two high-profile FTTP ventures have garnered a fair amount of attention, but have yet to have a significant impact.

4.3.2 United Kingdom

With high levels of urbanization and a per capita GDP that exceeded the EU average, it is perhaps unsurprising that the UK has exceeded EU coverage levels for NGA. NGA in the United Kingdom reached 58% of households in 2011 and 70% of households in 2012, which was higher than the EU levels of 48% and 54%, but below the U.S. levels of 73% and 82%. Rural NGA coverage registered a respectable 4% in 2011 and 18% in 2012, as compared with 9% and 12% in the EU and 38% and 48% in the U.S. LTE coverage was quiet modest at 0% in 2011 and 17% in 2012, while in the EU LTE coverage was 8% and 27% and in the U.S. LTE coverage was 68% and 86%. Rural LTE was 0%.

The UK government has one of the most significant public broadband subsidy programs in Europe. Between 2003 and 2006, the government spent more than \$2 billion on building public sector networks. More recently, the government allocated £530 million to the Broadband Delivery UK (BDUK) to support broadband buildout by local authorities on a technology-neutral basis, with an additional £250 million set aside for "super connected" cities.

VDSL

British VDSL registered a sharp gain during 2012, increasing from covering 26% of households in 2011

to covering 47% of households in 2012, accounting for almost all of the 12% growth in NGA coverage. This exceeded the EU rates of 19% and 25%. VDSL was also available in 4% of rural households in the UK during 2011 and 14% of rural households in 2012, a substantial improvement over EU levels of 3% and 5%.

These numbers are likely to improve even more in the near future. BT announced in April 2013 that it had reached its target of passing 50% of UK homes with VDSL, eighteen months ahead of schedule, and announced in October 2013 that it reached 57% of UK homes. BT was confident that it would reach its target of passing 66% of UK households by spring 2014.

The strong performance of VDSL in the UK is a direct reflection of the business strategies being pursued by BT. Although the company initially regarded DSL as a short-term bridge solution until it could deploy optical fiber, the company soon began to question the business case for FTTP.

Instead, BT is pursuing a VDSL strategy based on fiber-to-the-cabinet (FTTC). As BT Managing Director Mike Galvin said in May 2012, “Our FTTC delivers 80Mbit/s downstream and 20Mbit/s upstream and FTTH currently delivers 100Mbit/s downstream and 10Mbit/s upstream. I don’t think customers see it as a huge step between FTTC and FTTH. There is a subset of people who believe that FTTH is a pure answer and that it is ‘engineeringly elegant’ and something that everyone should go forward with. Our view is that we will be led by our customers and what we think

best meets their needs” (*Computing* 2012).

Consequently, BT has developed an aggressive plan to use FTTC to upgrade its DSL connections to VDSL. The figure on the next page shows the FTTC status of each city’s exchanges, according to BT’s current roll-out plans.

DOCSIS 3

DOCSIS 3 joined VDSL in playing a key role in supporting strong NGA coverage during both of the years covered in this study. In 2011, DOCSIS 3 was available in 46% of UK households, well above the 37% coverage achieved across the EU as a whole, but below the 72% coverage achieved in the U.S. By 2012, DOCSIS 3

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The strong performance of VDSL in the UK is a direct reflection of the business strategies being pursued by BT. Although the company initially regarded DSL as a short-term bridge solution until it could deploy optical fiber, the company soon began to question the business case for FTTP.

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	Total NGA	Rural NGA	DOCSIS 3 cable	VDSL	FTTP	LTE	Pct. DSL shared
U.K.	70%	18%	48%	47%	1%	17%	61%
Europe	54%	12%	39%	25%	12%	27%	46%
U.S.	82%	48%	81%	10%	23%	86%	n/a

	Investment per HH	Price 12-30 Mbps	Avg. speed Mbps	Bandwidth per user	Rural HHs	Population density	GDP per capita
U.K.	\$215	\$27.29	6.5	31	9%	259	105
Europe	\$244	\$27.64	5.7	18	15%	116	100
U.S.	\$562	\$28.76	7.4	27	19%	34	152

Current and Planned Upgrades to VDSL in British Cities

	Total exchanges	Already upgraded	Pct.	Scheduled for upgrade	Cumulative pct.
London	208	176	84%	20	94%
Birmingham	41	16	39%	14	73
Manchester	24	21	88%	3	100%
Cambridge	7	2	29%	0	29%
Exeter	5	1	20%	0	20%
Glasgow	33	10	30%	12	67%
Inverness	3	0	0%	1	33%
Cardiff	14	10	71%	4	100%
Bangor	1	1	100%	0	100%
Belfast	15	15	100%	0	100%
Derry-Londonderry	10	10	100%	0	100%

Source: Ofcom (2013).

coverage had crept upwards to 48% in the UK, as compared with 39% in the EU, and 82% in the U.S. Rural DOCSIS 3 coverage remained disappointing, reaching 0% of rural UK households in 2011 and only 5% of rural UK households in 2012, which was below the EU coverage rates of 4% and 6%.

Cable television emerged relatively late in the UK, but by the late 1990s, cable television service was available in 50% of the country. A series of mergers concentrated 90% of the industry in the hands of two companies, NTL and Telewest, which served nonoverlapping territories. The two companies merged with each other in 2006 and eventually joined with Virgin Mobile in 2006 to form a new company known as Virgin Media.

Cable modem service launched in 1997, three years prior to the launch of ADSL in 2000. Technical considerations limited the availability of cable modem service to 45% of the country at the time of launch and to 48% of the country as of 2012, in contrast to DSL, which was available in 60% of the country by 2001 and 99% of the country by 2006. Despite having greater bandwidth and being the first to deploy, the limited geographic reach of cable modem service caused it to be overtaken by ADSL in 2003.

The deployment of VDSL has caused cable modem's market share to stagnate. The cable industry has continued to invest in higher speeds, with the average speed on Virgin Media's network nearly doubled from May 2012 to May 2013 from 18 Mbps to 34 Mbps.

FTTP

The UK's FTTP coverage remains quite low, reaching only 0.2% of British households in 2011 and 0.7% of British households in 2012. Studies generally indicated that the business case for FTTP was relatively weak (Analysys Mason 2013). Consequently, as noted in the discussion on VDSL, BT has prioritized VDSL over FTTP as a matter of business strategy. That said, BT recognized that FTTP may have some appeal to small and medium sized enterprises. Thus, in July 2012, BT initiated trials in a handful of central offices. Deployment plans are limited, covering at most 25% of the country, and as Ofcom noted (2013a, 320), the high cost of FTTP means that its appeal will be predominantly limited to business customers. BT would not expand its FTTP service so long as customers indicate they remain satisfied with its 80 Mbps VDSL service. The relative weakness of FTTP did not seem to impair the UK's overall NGA coverage.

LTE

The UK got off to a late start in LTE deployments, having 0% LTE coverage as of the end of 2011, as compared with 8% in the EU and 68% in the U.S. Since that time, UK LTE providers have made steady progress, achieving 17% coverage by the end of 2012, as compared with 27% in the EU and 86% in the U.S. Rural LTE coverage continued to be 0%.

One of the primary reasons for delay in deploying LTE was the inability of the UK's largest wireless providers to agree on the design of the auction delayed completion of the digital dividend auction until February 2013. Despite the delays, LTE did appear in the UK in February and March 2012 courtesy of failed-WiMax provider UK Broadband. UK Broadband used spectrum in the 3.5 and 3.6 GHz bands originally auctioned in 2003 for fixed wireless and authorized for mobile wireless in 2007 under an alternative standard known as TD-LTE.

Moreover, in August 2012, the UK regulator approved EE's plan to redeploy some of its 1.8 GHz GSM spectrum for LTE on the condition that it sell 25% of its spectrum to the country's smallest wireless operator, 3 UK. EE launched LTE service in this band in October 2012 despite the fact that the UK had not yet completed its digital dividend auction. By June 2013, EE reached 55% of the UK population and forecast 98% coverage by the end of 2014.

In addition, all four of the leading UK wireless providers won licenses in the auction completed in February 2013. The block acquired by O2 requires that it provide indoor coverage for at least 98% of the UK population (including at least 95% of each to England, Northern

Ireland, Scotland, and Wales) by the end of 2017.

Telefónica-owned O2 and Vodafone launched their 800 MHz service in August 2013. By November 2013, EE launched service in the 2.6 GHz band to supplement its existing 1.8 GHz service. Finally, 3 UK launched service using its 800 MHz license as well as service in the 1.8 GHz spectrum it acquired from EE the previous year. Thus, by the end of 2013, all of the leading UK wireless providers were providing service in the bands that the EU had allocated for LTE.

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The UK was thus able to achieve fairly strong NGA coverage with roughly balanced contributions from VDSL and DOCSIS 3 and without any meaningful contribution from FTTP. BT remains committed to emphasizing VDSL over FTTP, and the explosive growth of VDSL appears to confirm the wisdom of this approach.

4.3.3 Germany

As a country with a low percentage of rural households, high population density, and high per capita GDP, Germany is a clear candidate for strong NGA coverage. German NGA coverage increased modestly from 64% to 66% from 2011 to 2012, rates that exceeded the 48% and 54% benchmarks of the EU, but fell short of the 73% and 82% benchmarks of the U.S. In terms of rural coverage, NGA was available in 22% of German households in 2011 and 26% of German households in 2012. This was considerably higher than the 9% and 12% levels in the EU, but fell below the 38% and 48% levels in the U.S. LTE, which was languishing at 22% in 2011, increased sharply to 52% in 2012, which is above the 8% and 27% coverage rates in the EU as a whole.

The primary driver of VDSL investments is facilities-based competition from cable broadband. There are some causes for concern, however. Investment per household is well below EU averages, and bandwidth usage per user is low.

VDSL

VDSL represented a significant determinant of the high levels of NGA coverage enjoyed by Germany. VDSL covered 41% of German households in 2011 and 46%

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of German households in 2012. This was significantly higher than the EU coverage rates of 19% and 25%. In rural areas, VDSL coverage was 13% in 2011 and 22% in 2012, both significantly higher than the EU rates of 3% and 5%.

Begun as a government-owned monopoly, the German telephone system was included as part of the Deutsche Bundespost as the post-war successor to the Reichspost. The 1989 postal reform separated it into a separate entity (along with the Deutsche Post and the Deutsche Postbank). In 1995, a subsequent round of reform renamed the company Deutsche Telecom and privatized it, although the German government still owns 32% of the company (15% directly and 17% through the government bank, KfW).

The German Federal Government adopted its “Broadband Strategy Paper” in February 2009. It includes two major objectives: increasing coverage of 1 Mbps service from 92% to 100% by 2010 and increasing 50 Mbps service from 20% to 75% by 2014.

Competition from cable broadband has forced telephone companies to invest to upgrade their networks. Vodafone deployed its VDSL network in the summer of 2010, and in December 2012, Deutsche Telecom announced that it is committing €6 billion to deploy VDSL2 with vectoring over an FTTC architecture, with plans to deliver vectored VDSL to 24 million households (65% of the population) by 2016. The German regulator approved vectoring in April 2013. In May 2013, Telefónica and Deutsche Telecom signed

an agreement permitting Telefónica to use Deutsche Telecom’s VDSL network.

The advent of vectoring and other technologies that permit VDSL to deliver speeds in excess of 30 Mbps are thus giving VDSL a more central role in delivering high-speed broadband.

DOCSIS 3

DOCSIS 3 was the other major technology contributing to strong German NGA coverage. DOCSIS 3 reached 46% of German households in 2011 and 52% in 2012, well above EU coverage levels of 37% and 39%, but behind U.S. coverage levels of 72% and 81%. DOCSIS 3 was substantially weaker in rural areas, reaching only 4% of German households in 2011 and 6% in 2012, which was right in line with EU benchmarks, but behind U.S. rural coverage of 37% and 40%.

The German cable television industry began in 1970, when a cooperative known as Senne TV began using master antenna cable systems to engage in private broadcasting, although the government fairly quickly shut down that operation. In 1971, the Bundespost initiated trials in Nuremberg and Hamburg. A December 1975 report issued by a blue-ribbon commission endorsing cable and urging that it be a federal monopoly was rejected by the government in 1977, which opted to authorize cable television only where there was an “acute public demand.”

	Total NGA	Rural NGA	DOCSIS 3 cable	VDSL	FTTP	LTE	Pct. DSL shared
Germany	66%	26%	52%	46%	3%	52%	47%
Europe	54%	12%	39%	25%	12%	27%	46%
U.S.	82%	48%	81%	10%	23%	86%	n/a

	Investment per HH	Price 12-30 Mbps	Avg. speed Mbps	Bandwidth per user	Rural HHs	Population density	GDP per capita
Germany	\$197	\$19.12	6.0	14	11%	229	123
Europe	\$244	\$27.64	5.7	18	15%	116	100
U.S.	\$562	\$28.76	7.4	27	19%	34	152

Eventually, the early prototype projects initiated during this period became part of Deutsche Telecom. Because the incumbent also owned cable system, cable broadband deployed slowly until 1999, when Deutsche Telecom spun off its cable assets into nine operating companies. A series of consolidations left the majority of the industry in the hands of two companies: Unity Media Kabel BW and Kabel Deutschland, although Vodafone acquired Kabel Deutschland in September 2013.

Cable modem service was introduced in 2003. By 2010, Kabel Deutschland had upgraded 85% of its connections to DOCSIS 3. In Germany, cable broadband can reach only 75% of all households nationwide, with the coverage being particularly low in states such as Saxony-Anhalt and Thuringia. Standard cable modem service is available in only 59% of German households and only 9% of German rural households, and cable providers are focusing their attention on upgrading their networks rather than expanding their footprints.

FTTP

FTTP has been slow to deploy in Germany, reaching only 2.4% of households in 2011 and 2.6% of households in 2012. These coverage levels were far below the EU-wide coverage rates of 10% in 2011 and 12% in 2012 as well as the U.S. coverage rates of 17% and 23%. Rural FTTP coverage was even lower at 0.4% in 2011 and 0.7% in 2012.

As discussed in the section on VDSL, Germany has chosen to deemphasize FTTP. A 2011 study by *Wissenschaftlichen Institut für Infrastruktur und Kommunikationsdienste* (WIK) (Scientific Institute for Infrastructure and Communication Services) concluded that a nationwide FTTP rollout would cost €70–€80 billion overall and €1000–€4000 per household. Assuming a 70% penetration rate with an average revenue per user (ARPU) of €38, only 25%–45% of German households could be profitably supplied with FTTP (WIK 2011). A subsequent study commissioned by the German *Bundesministerium für Wirtschaft und Technologie* (Federal Ministry of Economics and Technology) similarly placed the costs of a wide-area development of FTTP at €86–€94 billion (TÜV Rheinland 2013).

For these reasons, Deutsche Telecom has chosen to deemphasize FTTP. In fact, it has made clear that it

would pursue the technology only in areas where 10% of the households commit to adopting it. At the same time, approximately twenty regional network operators, such as NetCologne and NetAachen, are also making limited FTTB deployments in major metropolitan areas. The German *Bundeskartellamt* (2010) (German Federal Antitrust Agency) has taken steps to facilitate the buildout of FTTP by clarifying that cooperation in rural areas that currently lack broadband service is unproblematic under the antitrust laws and might be permissible in other areas if structured in a way unlikely to harm competition. Deutsche Telecom has indicated its willingness to cooperate with NetCologne, 1&1 Internet, and Telefónica Deutschland.

Begun as a government-owned monopoly, the German telephone system was included as part of the Deutsche Bundespost as the post-war successor to the Reichspost. The 1989 postal reform separated it into a separate entity...

LTE

In terms of LTE, Germany represents a success story. As of the end of 2011, national LTE coverage was 22% and rural LTE coverage was 33%, well above the EU averages of 8% and 5%. By the end of 2012, German national LTE coverage had soared to 52% and rural LTE coverage had reached 50%, again well above the EU averages of 27% and 10%.

One major reason for the robustness of Germany's LTE deployments is the fact that Germany completed its 4G auctions relatively early. In May 2010, it completed its 4G auction, which included the 800 MHz and 2.6 GHz auctions designed by the EU for LTE as well as the 1.8 GHz and 2.0 GHz spectrum.

The German licenses also included conditions that helped speed the buildout of rural areas. Winners of 800 MHz licenses bore the obligation to focus on rural areas. German communities were categorized by number of inhabitants, with level one including towns

with fewer than five thousand inhabitants and level four including cities with more than 50,000 inhabitants. With each level, each state designated communities that did not receive adequate broadband services. Holders of 800 MHz licenses had to build out 90% of the communities in each level before it could proceed to the next level. The desire to serve the largest metropolitan areas gave licensees strong incentive to buildout rural areas.

Of the four leading German wireless companies, Vodafone began providing LTE in September 2010, followed by Deutsche Telekom in April 2011, O2 (owned by Telefónica) in July 2011, and E-Plus (owned by KPN) in March 2014. By the end of 2013, the main providers served 180 to 200 German cities. O2 has announced plans to acquire E-Plus, which would make the merged company the largest wireless provider in Germany and would likely accelerate upgrading E-Plus's network to LTE.

The future LTE market will be characterized by the next-generation 4G technology known as LTE Advanced, which is capable of providing download speeds of 150 Mbps or even 300 Mbps. Deutsche Telekom has announced plans to introduce LTE Advanced by 2015/16, although Telefónica does not plan to follow suit. Discussions have also begun about reallocating the 700 MHz frequency band to wireless broadband.

5. CONCLUSION

The increasing availability of high-quality data has the promise to effect a sea change in broadband policy. Debates that previously relied primarily on anecdotal evidence and personal assertions of visions for the future can increasingly take place on a firmer empirical footing.

In particular, these data can resolve the question whether the U.S. is running behind Europe in the broadband race or vice versa. The U.S. and European mapping studies are clear and definitive: These data indicate that the U.S. is ahead of Europe in terms of the availability of Next Generation Access (NGA) networks. The U.S. advantage is even starker in terms of rural NGA coverage and with respect to key technologies such as FTTP and LTE.

Empirical analysis, both in terms of top-level statistics and in terms of eight country case studies, also sheds light into the key policy debate between facilities-based competition and service-based competition. The evidence again is fairly definitive, confirming that facilities-based competition is more effective in terms of driving broadband investment than service-based competition.

The empirical record also undercuts the position that the provision of high-speed Internet depends on fiber. In short, FTTP has remained a minor contributor to NGA coverage, and those countries that emphasized fiber represented the worst performers among the eight European countries studied. Even Sweden, an FTTP leader that is often lauded as a paragon of high-speed broadband service, only achieved NGA coverage of 57%, which is only slightly above the EU average. The other countries that emphasized different technologies or used a balanced approach consistently achieved higher NGA coverage rates and are placing increasing emphasis on VDSL, which will play a particularly important role in rural areas. These results suggest that broadband policy should not focus on any particular technology as the definitive solution. Instead, policymakers should recognize that

the viability of broadband technologies varies in urban and rural areas. If so, policymakers would be better served trying to promote a balanced approach that accommodates multiple technologies.

Finally, LTE coverage depended on early deployment of 2.6 GHz spectrum and a flexible approach to 1.8 GHz spectrum. Attempts to configure auctions to stimulate competitors led to considerable delays in deployment.

The empirical evidence produced by the mapping studies thus indicates that the United States is faring better than Europe in terms of broadband coverage and provides a strong endorsement of the regulatory approach taken by the U.S. These data stand as a major landmark with which anyone asserting otherwise must come to grips.

Despite the widespread availability, NGA adoption continues to languish. Studies have consistently shown that availability and cost are not the primary barriers to NGA adoption, but rather that nonsubscribers do not see the need for the service. As a result, ensuring that consumers enjoy the benefits created by the broadband depends as much on demand-side initiatives to encourage adoption, such as those identified by the National Broadband Plan and other similar documents, as it does on supply-side initiatives to upgrade the infrastructure.

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About the Report

Both the European Commission (EC) and the U.S. government have recently conducted or commissioned studies providing detailed information about the extent of broadband coverage as of the end of 2011 and 2012. These studies report coverage levels for a wide range of speed tiers and technologies in both urban and rural areas. Although the European mapping study focuses on Next Generation Access (NGA), which it defines to be service providing download speeds of at least 30 Mbps, a close analysis reveals that the study actually reports data for 25 Mbps service. Data from these studies served as the basis for analysis in this report.

These mapping studies were supplemented by other studies conducted or commissioned by the EC or the Federal Communications Commission that examine other key information, such as broadband investment, pricing, and download speeds.

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